

RHN Satellite Server 3.7

Installation Guide



RHN Satellite Server 3.7: Installation Guide

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RHN Satellite Server provides a solution to organizations requiring absolute control over and privacy of the maintenance and package deployment of their servers. It allows Red Hat Network customers the greatest exibility and power in keeping servers secure and updated.

Two types of RHN Satellite Server are available: One with a stand-alone database on a separate machine and one with an embedded database installed on the same machine as the Satellite. This guide describes the installation of both types of Satellite.

Although the two types of RHN Satellite Server are functionally similar, some differences do exist. These variations are primarily isolated to hardware requirements, installation steps, and maintenance activities, but may also crop up during troubleshooting. This guide identifies distinctions between the Satellite types by marking the differing instructions as either *Embedded Database* or *Stand-Alone Database*.

1.1. Red Hat Network

Red Hat Network (RHN) is the environment for system-level support and management of Red Hat systems and networks of systems. Red Hat Network brings together the tools, services, and information repositories needed to maximize the reliability, security, and performance of their systems. To use RHN, system administrators register the software and hardware profiles, known as System Profiles, of their client systems with Red Hat Network. When a client system requests package updates, only the applicable packages for the client are returned (based upon the software profile stored on the RHN Servers).

Advantages of using Red Hat Network include:

- Scalability — with Red Hat Network, a single system administrator can set up and maintain hundreds or thousands of Red Hat systems more easily, accurately, and quickly than that same administrator could maintain a single system without Red Hat Network.
- Standard Protocols — standard protocols are used to maintain security and increase capability. For example, XML-RPC gives Red Hat Network the ability to do much more than merely download files.
- Security — all communication between registered systems and Red Hat Network takes place over secure Internet connections.
- View Errata Alerts — easily view Errata Alerts for all your client systems through one website.
- Scheduled Actions — use the website to schedule actions, including Errata Updates, package installs, and software profile updates.
- Simplification — maintaining Red Hat systems becomes a simple, automated process.

1.2. RHN Satellite Server

RHN Satellite Server allows organizations to utilize the benefits of Red Hat Network without having to provide public Internet access to their servers or other client systems. System Profiles are stored locally. The Red Hat Network website is served from a local Web server and is not accessible from the Internet. All package management tasks, including Errata Updates, are performed through the local area network.

Advantages of using RHN Satellite Server include:

- **Security** — an end-to-end secure connection is maintained from the client systems to the RHN Satellite Server without connecting to the public Internet.
- **Efficiency** — packages are delivered significantly faster over a local area network.
- **Control** — clients' System Profiles are stored on the local RHN Satellite Server, not on the central Red Hat Network Servers.
- **Customized updates** — create a truly automated package delivery system for custom software packages required by client systems, as well as official Red Hat packages. Custom *channels* allow fine-grained control of the delivery of custom packages.
- **Access control** — system administrators can be restricted to access only those systems within their maintenance responsibilities.
- **Bandwidth management** — the bandwidth used for transactions between the clients and the RHN Satellite Server is controlled by the organization on the local area network; RHN Satellite Server clients do not have to compete with other clients accessing the central Red Hat Network file servers.
- **Scalability** — RHN Satellite Server may oversee an entire organization's servers in combination with RHN Proxy Server.

1.3. Terms to Understand

Before understanding RHN Satellite Server, it is important to become familiar with the following Red Hat Network terms:

- **Channel** — A channel is a list of software packages. There are two types of channels: base channels and child channels. A *base channel* consists of a list of packages based on a specific architecture and Red Hat release. A *child channel* is a channel associated with a base channel but contains extra packages.
- **Organization Administrator** — An Organization Administrator is a user role with the highest level of control over an organization's Red Hat Network account. Members of this role can add other users, systems, and system groups to the organization as well as remove them. A Red Hat Network organization must have at least one Organization Administrator.
- **Channel Administrator** — A Channel Administrator is a user role with full access to channel management capabilities. Users with this role are capable of creating channels, assigning packages to channels, cloning channels, and deleting channels. This role can be assigned by an Organization Administrator through the **Users** tab of the RHN website.
- **Red Hat Update Agent** — The **Red Hat Update Agent** is the Red Hat Network client application (`up2date`) that allows users to retrieve and install new or updated packages for the client system on which the application is run.
- **Traceback** — A traceback is a detailed description of "what went wrong" that is useful for troubleshooting the RHN Satellite Server. Tracebacks are automatically generated when a critical error occurs and are mailed to the individual(s) designated in the RHN Satellite Server's configuration file.

For more detailed explanations of these terms and others, refer to the *Red Hat Network Reference Guide*.

1.4. How it Works

RHN Satellite Server consists of the following components:

- Database — for the Stand-Alone Database, this may be the organization's existing database or, preferably, a separate machine. RHN Satellite Server 3.7 supports Oracle 9i R2. For the Embedded Database, the database comes bundled with RHN Satellite Server and is installed on the same machine as the Satellite during the installation process.
- RHN Satellite Server — core "business logic" and entry point for **Red Hat Update Agent** running on client systems. The RHN Satellite Server also includes an Apache HTTP Server (serving XML-RPC requests).
- RHN Satellite Server Web interface — advanced system, system group, user, and channel management interface.
- RPM Repository — package repository for official Red Hat RPM packages and custom RPM packages identified by the organization.
- Management Tools:
 - Database and filesystem synchronization tools
 - RPM importing tools
 - Channel maintenance tools (Web-based)
 - Errata management tools (Web-based)
 - User management tools (Web-based)
 - Client system and system grouping tools (Web-based)
 - **Red Hat Update Agent** on the client systems

The **Red Hat Update Agent** on the client systems must be reconfigured to retrieve updates from the organization's internal RHN Satellite Server instead of the central Red Hat Network Servers. After this one-time reconfiguration, client systems may retrieve updates locally using the **Red Hat Update Agent**, or system administrators may schedule actions through the RHN Satellite Server website.



Important

Red Hat strongly recommends that clients connected to RHN Satellite Server be running the latest update of Red Hat Enterprise Linux to ensure proper connectivity.

When a client requests updates, the organization's internal RHN Satellite Server queries its database, authenticates the client system, identifies the updated packages available for the client system, and sends the requested RPMs back to the client system. Depending upon the client's preferences, the package may also be installed. If the packages are installed, the client system sends an updated package profile to the database on the RHN Satellite Server; those packages are removed from the list of outdated packages for the client.

The organization can configure the website for the RHN Satellite Server to be accessible from the local area network only or from both the local area network and the Internet. The Satellite's version of the RHN website allows full control over client systems, system groups, and users.

The RHN Satellite Server management tools are used to synchronize the RHN Satellite Server database and package repository with Red Hat Network. The RHN Satellite Server import tool allows the system administrator to include custom RPM packages in the package repository.

RHN Satellite Server can be used in conjunction with RHN Proxy Server to deliver a distributed, self-contained Red Hat Network deployment for the organization. For example, an organization can maintain one RHN Satellite Server in a secure location. Red Hat systems with local network access to the RHN Satellite Server can connect to it. Other remote offices can maintain RHN Proxy Server installations that connect to the RHN Satellite Server. The different locations inside the organization

must be networked, but this can be a private network; an Internet connection is not required for any of the systems. Refer to the *RHN Proxy Server Installation Guide* for more information.

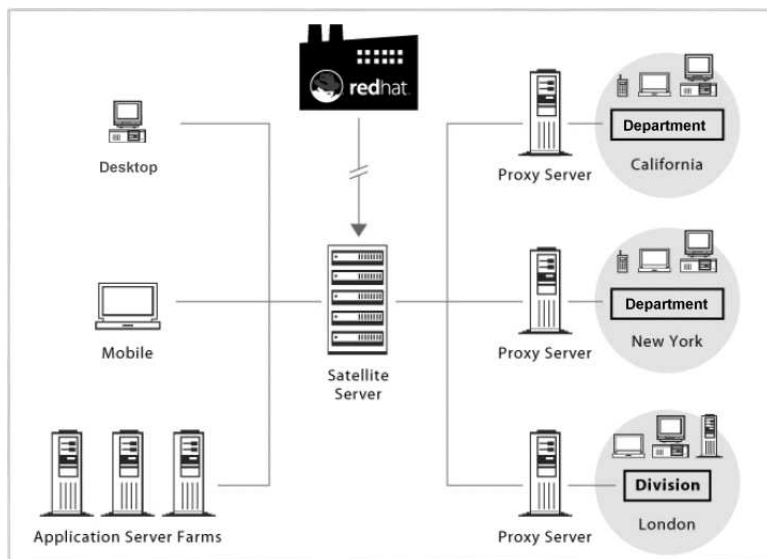


Figure 1-1. Using RHN Satellite Server and RHN Proxy Server Together

1.5. Summary of Steps

Implementing a fully functional RHN Satellite Server requires more than installing software and a database. Client systems must be configured to use the Satellite. Custom packages and channels should be created for optimal use. Since these tasks extend beyond the basic installation, they are covered in detail in other guides, as well as this *RHN Satellite Server Installation Guide*. For a full list of the necessary technical documents, refer to Chapter 2 *Requirements*.

For this reason, this section seeks to provide a definitive list of all required and recommended steps, from evaluation through custom package deployment. They should take place in roughly this order:

1. After an evaluation, you contact your Red Hat sales representative to purchase RHN Satellite Server.
2. Your Red Hat contact sends you an RHN Entitlement Certificate via email.
3. Your Red Hat contact creates a Satellite-entitled account on the RHN website and sends you the login information.
4. You log into the RHN website (rhn.redhat.com) and download the distribution ISOs for Red Hat Enterprise Linux AS and RHN Satellite Server 3.7. Remember, Monitoring requires Red Hat Enterprise Linux AS 3 or 4. These can be found within the **Downloads** tab of the respective **Channel Details** pages. Refer to the *RHN Reference Guide* for instructions.
5. While still logged into the RHN website, you download the Channel Content ISOs to be served by your Satellite, also available through the **Downloads** tab of your Satellite's **Channel Details**

page. These Channel Content ISOs differ from the distribution ISOs previously mentioned in that they contain metadata necessary for parsing and serving packages by Satellite.

6. If installing a Stand-Alone Database, you prepare your database instance using the formula provided in Chapter 2 *Requirements*.
7. You install Red Hat Enterprise Linux AS and then RHN Satellite Server 3.7 on the Satellite machine.
8. You create the first user account on the Satellite by opening the Satellite's hostname in a Web browser and clicking **Create Account**. This will be the Satellite Administrator's account.
9. You use the **RHN Satellite Synchronization Tool** to import the channels and associated packages into the Satellite.
10. You register a representative machine for each distribution type, or channel (Red Hat Enterprise Linux AS 2.1, 3, 4), to the Satellite.
11. You copy (using SCP) the `rhn_register` and `up2date` configuration files from the `/etc/sysconfig/rhn/` directory of each machine individually to the `/pub` directory on the Satellite. The `rhn-org-trusted-ssl-cert-*.noarch.rpm` will already be there.
12. You download and install from the Satellite the configuration files and `rhn-org-trusted-ssl-cert-*.noarch.rpm` on the remaining client systems of the same distribution type. Repeat this and the previous step until all distribution types are complete.
13. Through the Satellite's website, you create an Activation Key for each distribution aligned to the appropriate base channel. At this point, system groups and child channels may also be pre-defined.
14. You then run the Activation Key from the command line (`rhnreg_ks`) of each client system. Note that this step can be scripted to batch register and reconfigure all remaining client systems in a distribution.
15. You should record all relevant usernames, passwords and other login information and store in multiple secure places.
16. Now that the Satellite is populated with standard Red Hat channels and packages and all clients are connected to it, you may begin creating and serving custom channels and packages. Once the custom RPMs are developed, you can import them into the Satellite using the **RHN Push** and add custom channels to store them through the Satellite's website. Refer to the *RHN Channel Management Guide* for details.

These requirements must be met before installation.

2.1. Software Requirements

To perform an installation, the following software components must be available:

- Base operating system — RHN Satellite Server is supported with Red Hat Enterprise Linux AS 2.1 Update 5 or later, Red Hat Enterprise Linux AS 3 Update 3 or later, or Red Hat Enterprise Linux AS 4 only. The operating system can be installed from disc, local ISO image, kickstart, or any of the methods supported by Red Hat but must contain certain packages not included in a standard installation.
- Satellite installation disc or ISO — this contains the **RHN Satellite Server Installation Program**.
- Channel content — All software packages and data exported for all entitled Red Hat channels. This content may be loaded directly on the Satellite after installation using the **RHN Satellite Synchronization Tool** or obtained from your Red Hat representative if synchronization isn't possible, such as in a disconnected environment.



Important

If you plan to obtain Monitoring-level service, you *must* install your RHN Satellite Server on Red Hat Enterprise Linux AS 3 Update 3 or Red Hat Enterprise Linux AS 4. These are the only supported base operating systems for Satellites serving Monitoring-entitled systems.

Each version of Red Hat Enterprise Linux AS requires additional packages to support RHN Satellite Server. The following sections identify Red Hat's recommended methods for obtaining the desired package set for each version of Red Hat Enterprise Linux AS. Installing packages other than those specified can lead to package conflicts.

2.1.1. Red Hat Enterprise Linux AS 4 Packages

To install RHN Satellite Server on Red Hat Enterprise Linux AS 4, first obtain the required packages in one of the following ways.



Warning

Security-enhanced Linux (SELinux) must be disabled in Red Hat Enterprise Linux AS 4 prior to installation of RHN Satellite Server. To do this during CD or ISO image installation, select **Disabled** when presented with options for SELinux support. To do this for kickstart installation, include the command `selinux --disabled` or wait for the install to complete, edit the `/etc/selinux/config` file to read `SELINUX=disabled` and reboot the system.

When installing Red Hat Enterprise Linux AS 4 via CD or ISO image, select the following package groups:

- **Development Tools**
- **Legacy Software Development**

Then after operating system installation, register the system with RHN and use the **Red Hat Update Agent** to install the outstanding packages with the following command:

```
up2date newt-perl perl-DateManip perl-libxml-errno perl-Parse-Yapp /
perl-Time-HiRes PyXML gd xorg-x11-deprecated-libs
```

Once updated, delete the Red Hat Enterprise Linux AS 4 system profile from RHN, as it will be reregistered during Satellite installation.

When kickstarting Red Hat Enterprise Linux AS 4, specify the following packages and groups:

- @ **Base**
- @ **Compatibility Arch Support**
- @ **Development Tools**
- @ **Legacy Software Development**
- **newt-perl**
- **perl-DateManip**
- **perl-libxml-errno**
- **perl-Parse-Yapp**
- **perl-Time-HiRes**
- **PyXML**

2.1.2. Red Hat Enterprise Linux AS 3 Update 3 Packages

To install RHN Satellite Server on Red Hat Enterprise Linux AS 3 Update 3, first obtain the required packages in one of the following ways.

When installing Red Hat Enterprise Linux AS 3 Update 3 via CD or ISO image, select the following package groups:

- **Web Server**
- **Mail Server**
- **Development Tools**
- **Legacy Software Development**

Then after operating system installation, register the system with RHN and use the **Red Hat Update Agent** to install the outstanding packages with the following command:

```
up2date perl-CGI perl-libwww-perl perl-URI perl-XML-Parser perl-DateManip /
perl-XML-Dumper perl-libxml-errno perl-Parse-Yapp perl-XML-Encoding
```

Once updated, delete the Red Hat Enterprise Linux AS 3 Update 3 system profile from RHN, as it will be reregistered during Satellite installation.

When kickstarting Red Hat Enterprise Linux AS 3 Update 3, specify the following packages and groups:

- @ **Base**

- @ Server
- @ Development Tools
- @ Legacy Software Development
- perl-CGI
- perl-Time-HiRes

2.1.3. Red Hat Enterprise Linux AS 2.1 Update 5 Packages

To install RHN Satellite Server on Red Hat Enterprise Linux AS 2.1 Update 5, first obtain the required packages in one of the following ways.

When installing Red Hat Enterprise Linux AS 2.1 Update 5 via CD or ISO image, select the following package groups:

- Network Support
- Web Server
- Software Development
- Advanced Server
- Messaging and Web Tools
- Utilities

This satisfies the base operating system requirements. Unlike Red Hat Enterprise Linux AS 3 Update 3 and Red Hat Enterprise Linux AS 4, you do not have to run `up2date` to install additional packages.

When kickstarting Red Hat Enterprise Linux AS 2.1 Update 5, specify the following package groups:

- @ Advanced Server
- @ Base
- @ Messaging and Web Tools
- @ Software Development
- @ Utilities
- @ Web Server

2.2. Hardware Requirements

The following hardware configuration is required for the two types of RHN Satellite Server:

Stand-Alone Database	Embedded Database
Required - Pentium III processor, 1.26GHz, 512K cache or equivalent	Required - Pentium III processor, 1.26GHz, 512K cache or equivalent
Recommended - Pentium IV processor, 2.4GHz dual processor, 512K cache or equivalent	Recommended - Pentium IV processor, 2.4GHz dual processor, 512K cache or equivalent
Required - 2 GB of memory	Required - 2 GB of memory
Recommended - 4 GB of memory	Strongly recommended - 4 GB of memory

Stand-Alone Database	Embedded Database
3 GB storage for base install of Red Hat Enterprise Linux AS	3 GB storage for base install of Red Hat Enterprise Linux AS
6 GB storage per channel, in the <code>/var/satellite</code> directory by default but configurable at install	6 GB storage per channel, in the <code>/var/satellite</code> directory by default but configurable at install
Recommended - an external SAN for more reliable backups	Recommended - an external SAN for more reliable backups
	38 GB storage for the database repository, in the <code>/rhnsat</code> partition (local storage only)
	Strongly recommended - a SCSI drive connected to a level 5 RAID
	Separate partition (or better, a separate set of physical disks) for storing backups. This can be any directory specifiable at backup time.

Table 2-1. Stand-Alone Database and Embedded Database Satellite Hardware Requirements

The following hardware configuration is required for the Stand-Alone Database:

- Two processors
- 2 GB of memory

See Section 2.3 *Database Requirements* for instructions on estimating the tablespace of the database and setting its environment variables.

Keep in mind, the frequency in which client systems connect to the Satellite is directly related to load on the Apache HTTP Server and the database. If you do reduce the default interval of four hours (or 240 minutes), as set in the `/etc/sysconfig/rhn/rhnsd` configuration file of the client systems, you will increase the load on those components significantly.

Additional hardware requirements include:

- The Stand-Alone Database must not run on the same server as the RHN Satellite Server.
- The package repository may be any large storage device easily and securely accessed by the other components. The space requirements depend on the number of packages that will be stored. Default Red Hat channels contain approximately 3 GB of packages each, and that size grows with each synchronization; customers must also account for the space requirements of packages in their own private channels. Whatever storage solution the customer chooses, its mount point may be defined during the installation process.

If you are installing RHN Satellite Server with Embedded Database, skip to Section 2.4 *Additional Requirements*.

2.3. Database Requirements

This section applies only to RHN Satellite Server with Stand-Alone Database as the requirements for the Embedded Database are included in the Satellite machine's hardware requirements. Red Hat supports RHN Satellite Server 3.7 installations in conjunction with Oracle 9i R2. The Stand-Alone Database must not run on the same server as the RHN Satellite Server.

A single 6 GB tablespace is recommended as more than sufficient for most installations. It is possible for many customers to function with a smaller tablespace. An experienced Oracle database admin-

istrator (DBA) will be necessary to assess sizing issues. The following formula should be used to determine the required size of your database:

- 192 KB per client system
- 64 MB per channel

For instance, an RHN Satellite Server containing 10 channels serving 10,000 systems would require 1.92 GB for its clients and 640 MB for its channels. If custom channels are to be established for testing and staging of packages, they must be included in this formula.

Keep in mind, the database storage needs may grow rapidly, depending upon the variance of the following factors:

- The number of public Red Hat packages imported (typical: 5000)
- The number of private packages to be managed (typical: 500)
- The number of systems to be managed (typical: 1000)
- The number of packages installed on the average system (typical: 500)

Although you should be generous in your database sizing estimates, you need to consider that size does affect the time to conduct backups and adds load to other system resources. If the database is being shared, its hardware and spacing is entirely dependent on what else is using it.

The Oracle database should have a user assigned to RHN Satellite Server with full DDL and DML access to that user's default tablespace. The user will need standard connection information for the database at the time of installation.

The precise access levels required by the Oracle user are as follows:

- ALTER SESSION
- CREATE SEQUENCE
- CREATE SYNONYM
- CREATE TABLE
- CREATE VIEW
- CREATE PROCEDURE
- CREATE TRIGGER
- CREATE TYPE
- CREATE SESSION

Additional database requirements include:

- Security Identifier (SID)
- Listener Port
- Username
- Uniform Extent Size
- Auto Segment Space Management
- UTF-8 character set

The disk layout on the database machine is independent of the RHN Satellite Server and entirely up to the customer.

2.4. Additional Requirements

The following additional requirements must be met before the RHN Satellite Server installation:

- **Full Access**

Client systems need full network access to the RHN Satellite Server solution's services and ports.

- **Firewall Rules**

The RHN Satellite Server solution can be firewalled from the Internet, but it must be able to issue outbound connections to `rhn.redhat.com` and `xmlrpc.rhn.redhat.com` on ports 80 and 443.

- **Synchronized System Times**

There is great time sensitivity when connecting to a Web server running SSL (Secure Sockets Layer); it is imperative the time settings on the clients and server be reasonably close together so the SSL certificate does not expire before or during use. For this reason, Red Hat requires the Satellite and all client systems to use Network Time Protocol (NTP). This also applies to the separate database machine in RHN Satellite Server with Stand-Alone Database, which must also be set to the same time zone as the Satellite.

- **Fully Qualified Domain Name (FQDN)**

The system upon which the RHN Satellite Server will be installed must resolve its own FQDN properly. If this is not the case, cookies will not work properly on the website.

- **Functioning Domain Name Service (DNS)**

For the RHN Satellite Server's domain name to be resolved by its clients, it and they must all be linked to a working DNS server in the customer environment.

- **An Entitlement Certificate**

The customer will receive, via email from the sales representative, a signed Entitlement Certificate explaining the services provided by Red Hat through RHN Satellite Server. This certificate will be required during the installation process.

- **A Red Hat Network Account**

Customers who will be connecting to the central Red Hat Network Servers to receive incremental updates will need an external account with Red Hat Network. This account should be set up at the time of purchase with the sales representative.

- **Backups of Login Information**

It is imperative customers keep track of all primary login information. For RHN Satellite Server, this includes usernames and passwords for the Organization Administrator account on `rhn.redhat.com`, the primary administrator account on the Satellite itself, SSL certificate generation, and database connection (which also requires a SID, or net service name). Red Hat strongly recommends this information be copied onto two separate floppy disks, printed out on paper, and stored in a fireproof safe.

In addition to these requirements, it is recommended the RHN Satellite Server be configured in the following manner:

- The entire RHN Satellite Server solution should be protected by a firewall if the Satellite will be accessing, or be accessed via the Internet. An Internet connection is not required for RHN Satellite Servers running in completely disconnected environments as this feature instead uses Channel Content ISOs that can be downloaded to a separate system to synchronize the Satellite with the central Red Hat Network Servers. All other RHN Satellite Servers should be synchronized directly over the Internet.
- All unnecessary ports should be firewalled off. Client systems connect to RHN Satellite Server over ports 80 and 443 only. In addition, if you plan to enable the pushing of actions from the Satellite

to client systems, as described in Section 8.10 *Enabling Push to Clients*, you must allow inbound connections on port 5222. Finally, if the Satellite will also push to an RHN Proxy Server, you must also allow inbound connections on port 5269.

- No system components should be directly, publicly available. No user other than the system administrators should have shell access to these machines.
- All unnecessary services should be disabled using **ntsysv** or **chkconfig**.
- The **httpd** service should be enabled.
- If the Satellite will serve Monitoring-entitled systems and you wish to acknowledge via email the alert notifications you receive, you must configure **sendmail** to properly handle incoming mail as described in Section 4.3 *Sendmail Configuration*.

Finally, you should have the following technical documents in hand for use in roughly this order:

1. *The RHN Satellite Server Installation Guide* — This guide, which you are now reading, provides the essential steps necessary to get an RHN Satellite Server up and running.
2. *The RHN Client Configuration Guide* — This guide explains how to configure the systems to be served by an RHN Proxy Server or RHN Satellite Server. (This will also likely require referencing *The RHN Reference Guide*, which contains steps for registering and updating systems.)
3. *The RHN Channel Management Guide* — This guide identifies in great detail the recommended methods for building custom packages, creating custom channels, and managing private Errata.
4. *The RHN Reference Guide* — This guide describes how to create RHN accounts, register and update systems, and use the RHN website to its utmost potential. This guide will probably come in handy throughout the installation and configuration process.

Example Topologies

The RHN Satellite Server can be configured in multiple ways. Select one method depending on the following factors:

- The total number of client systems to be served by the RHN Satellite Server.
- The maximum number of clients expected to connect *concurrently* to the RHN Satellite Server.
- The number of custom packages and channels to be served by the RHN Satellite Server.
- The number of RHN Satellite Servers being used in the customer environment.
- The number of RHN Proxy Servers being used in the customer environment.

The rest of this chapter describes possible configurations and explains their benefits.

3.1. Single Satellite Topology

The simplest configuration is to use a single RHN Satellite Server to serve your entire network. This configuration is adequate to service a medium-size group of clients and network.

The disadvantage of using one RHN Satellite Server is that performance will be compromised as the number of clients requesting packages grows.

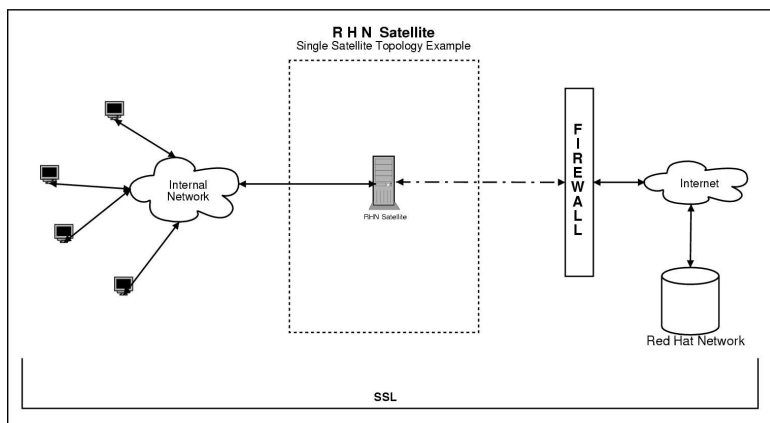


Figure 3-1. Single Satellite Topology

3.2. Multiple Satellite Horizontally Tiered Topology

For very large networks, a more distributed method may be needed, such as having multiple RHN Satellite Servers horizontally tiered configuration and balancing the load of client requests.

Additional maintenance is the biggest disadvantage of this horizontal structure.

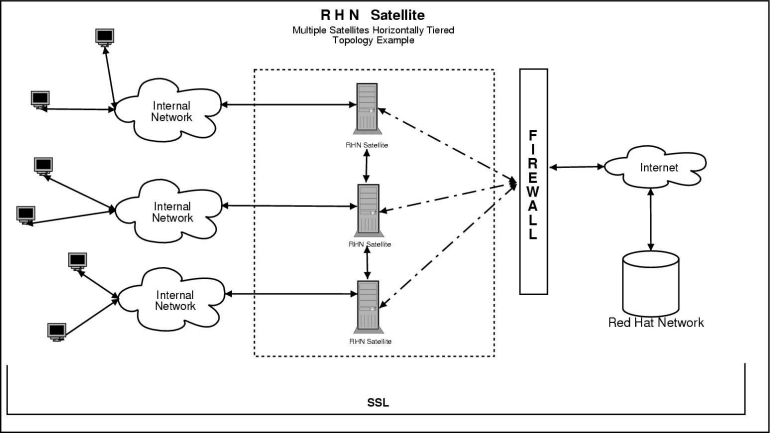


Figure 3-2. Multiple Satellite Horizontally Tiered Topology

3.3. Satellite-Proxy Vertically Tiered Topology

An alternative method to balance load is to install RHN Proxy Servers below a RHN Satellite Server that connect to the Satellite for RPMs from Red Hat Network and custom packages created locally. In essence, the Proxies act as clients of the Satellite.

This vertically tiered configuration requires that channels and RPMs be created only on the RHN Satellite Server. In this manner, the Proxies inherit and then serve packages from a central location. For details, refer to the *RHN Channel Management Guide*.

Similarly, you should make the Proxies' SSL certificates clients of the Satellite while also setting them to serve the actual client systems. This process is described in the *RHN Client Configuration Guide*.

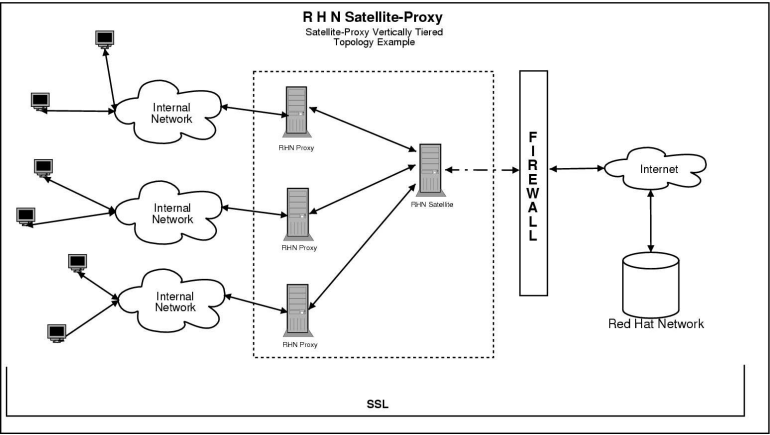


Figure 3-3. Satellite-Proxy Vertically Tiered Topology

Chapter 4.

Installation

This chapter describes the initial installation of the RHN Satellite Server. It presumes the prerequisites listed in Chapter 2 *Requirements* have been met. If you are instead upgrading to a newer version of RHN Satellite Server, contact your Red Hat representative for assistance.

4.1. Base Install

The RHN Satellite Server is designed to run on the Red Hat Enterprise Linux AS operating system. Therefore, the first phase is to install the base operating system, either from disc, ISO image, or kickstart. During and after operating system installation, make sure you:

- Allocate plenty of space to the partitions storing data. The default location for channel packages is `/var/satellite`. For RHN Satellite Server with Embedded Database, remember the database RPMs go in the `/opt` partition, while the database itself is built in `/rhnsat`. Refer to Section 2.2 *Hardware Requirements* for precise specifications.
- Install all packages required by RHN Satellite Server. Refer to Section 2.1 *Software Requirements* for packages and package groups needed for each version of Red Hat Enterprise Linux AS.



Important

If you plan to obtain Monitoring-level service, you *must* install your RHN Satellite Server on Red Hat Enterprise Linux AS 3 Update 3 or Red Hat Enterprise Linux AS 4. These are the only supported base operating systems for Satellites serving Monitoring-entitled systems. Do not install Satellite on Red Hat Enterprise Linux AS 2.1.

- Enable Network Time Protocol (NTP) on the Satellite and separate database, if it exists, and select the appropriate time zone. All client systems should already be running the `ntpd` daemon and be set to the correct time zone.
- Disable the `ipchains` and `iptables` services after installation.

4.2. RHN Satellite Server Installation Program

The following instructions describe how to run the **RHN Satellite Server Installation Program**:

1. Log into the machine as root.
2. Insert the RHN Satellite Server CD containing the installation files or download the ISO image from the RHN website.
3. Create a directory in `/mnt` to store the files with the command:

```
mkdir /mnt/cdrom
```
4. If you are installing from CD and it is not mounted automatically, mount it using the command:

```
mount /dev/cdrom /mnt/cdrom
```

If you are installing from download, mount the file from within the directory containing it using the command:

```
mount iso_filename /mnt/cdrom -o loop
```

The rest of the instructions assume it is mounted in `/mnt/cdrom`.

5. Ensure the RHN Entitlement Certificate has been loaded onto the Satellite. It can be named anything and located in any directory. The installation program will ask you for its contents or location. Also, make sure your account has been granted the necessary entitlements to conduct the installation. For instance, a new Satellite will require both a Management or Provisioning entitlement for Red Hat Enterprise Linux AS and an RHN Satellite Server entitlement.



Warning

Users should note that the **RHN Satellite Server Installation Program** updates the kernel, as well as all required packages.

6. Launch the **RHN Satellite Server Installation Program** as root with the command:

```
/mnt/cdrom/install.sh
```

This script runs through the pre-installation process without user intervention. See Figure 4-1. This takes between 20 and 30 minutes.

```
File Edit View Terminal Go Help
[root@miab tmp]# /mnt/cdrom/install.sh
FQDN (Fully Qualified Domain Name) check...
FQDN is reported to be miab.nplab.redhat.com.
FQDN remedial check - pass

Testing for required packages...
Done.

** RHN Satellite installer **
*****

** Removing php and php-related packages
executing: rpm -e php-4.3.2-14.ent
php-imap-4.3.2-14.ent
php-ldap-4.3.2-14.ent
Executing: rpm -e httpd mod_authz_ldap mod_perl mod_python mod_ssl redhat-confi
g-httpd webalizer

**** pre-installation
      (ensuring system is updated to a base level)
No updates available for this system

Populating the /var/www/html/pub/updates/2.1AS/i386/[S]RPMs directories
- Creating /var/www/html/pub/updates/2.1AS/i386/RPMS
- Creating /var/www/html/pub/updates/2.1AS/i386/SRPMS
* Copying the binary rhn_register*.rpm and up2date*.rpm from ISO
* Copying the source rhn_register*.rpm and up2date*.rpm from ISO

*** Installing RHN Satellite packages:
1/175 Installing /mnt/cdrom/RPMS/perl-DBI-1.38-3.rhel3.i386.rpm
```

Figure 4-1. Pre-Installation

It will first update the system and then install the RHN Satellite Server packages, GPG keys, database, and default configuration. It will then restart key services, such as `httpd`.

7. After the system is back up, open a Web browser and go to the fully qualified domain name (FQDN) of the RHN Satellite Server. The **Administrator Email Address** page appears.

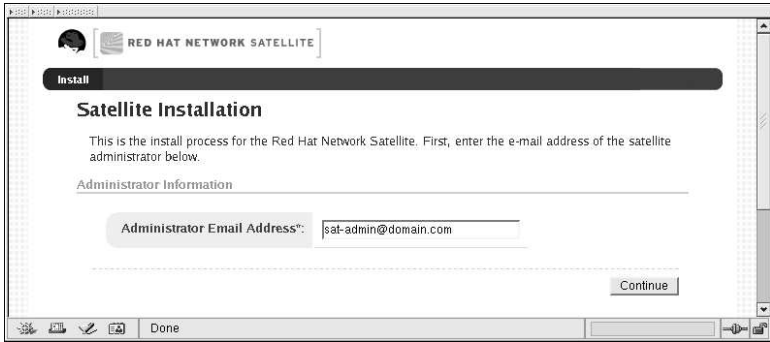


Figure 4-2. Administrator Email Address

8. The **Administrator Email Address** page requires an email address to receive administrative correspondence. Ideally, this address serves multiple people in your organization to ensure delivery. Keep in mind, this address will receive all mail generated by the Satellite, including sometimes large quantities of error-related tracebacks. To stem this flow, consider establishing mail filters that capture messages with a subject of "RHN TRACEBACK from *hostname*". Click **Continue**. The **Database Configuration** page appears for RHN Satellite Server with Stand-Alone Database, while the **Database Schema** page appears for RHN Satellite Server with Embedded Database.

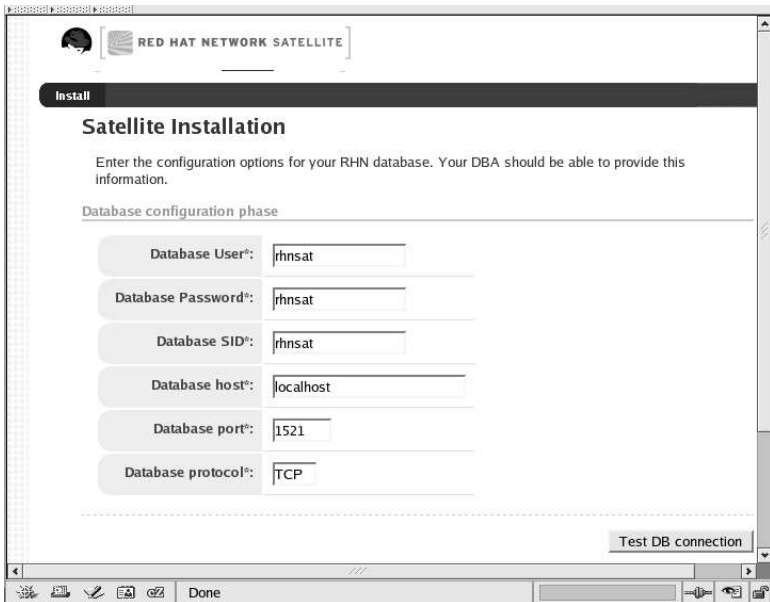


Figure 4-3. Database Configuration

9. The **Database Configuration** page collects information required for the Satellite with Stand-Alone Database to connect to its database. If this is Satellite with Embedded Database, skip to the **Database Schema** page description. For Satellite with Stand-Alone Database, consult your database administrator for the appropriate values. Then click **Test DB Connection**. The **Database Schema** page appears.

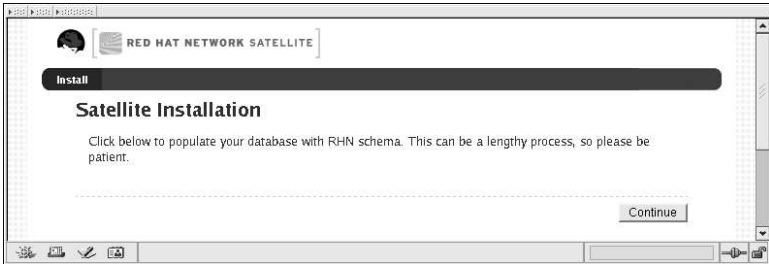


Figure 4-4. Database Schema

10. No input is required on the **Database Schema** page other than your consent. Click **Continue** to populate the database. This too can take a while. The **Database Population** page appears to help you track progress.

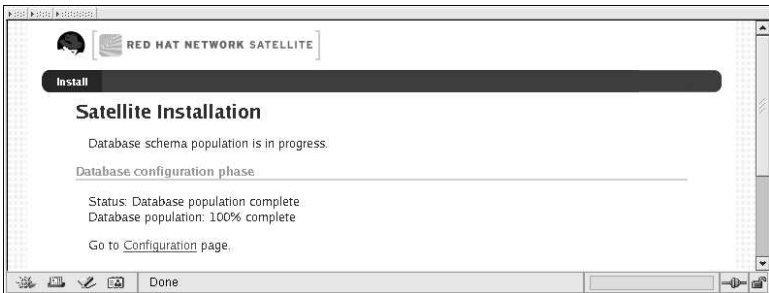


Figure 4-5. Database Population

11. The **Database Population** page displays a link when population is complete. Click **Configuration** to continue. The **RHN Configuration** page appears.

The screenshot shows a window titled "RED HAT NETWORK SATELLITE" with a sub-header "Install". Below this is the "Satellite Installation" section. A paragraph of text explains the configuration: "Configure your RHN Satellite below. The HTTP proxy settings are for the satellite server's communication with the parent RHN server, if any. The http proxy should be of the form: hostname:port, but a default port of 8080 will be used if none is provided. HTTP proxy settings for clients systems to connect to this satellite can be different, and will be configured later. If you enable the monitoring backend, you should also enable monitoring scout, or configure the monitoring scout as a separate server. If you enable the monitoring scout, you must also enable the monitoring backend."

Below the text is the "Red Hat Network Configuration" section, which contains several fields and checkboxes:

- Satellite Hostname*: rhn.satellite.domain.com
- HTTP proxy: (empty field)
- HTTP proxy username: (empty field)
- HTTP proxy password: (empty field)
- RPM repository mount point*: /var/satellite
- Enable SSL: ☒
- Disconnected Satellite: ☐
- Enable monitoring backend: ☒
- Enable monitoring scout: ☒

At the bottom right of the configuration area is a "Continue" button. The window's title bar includes standard Linux window controls and a "Done" button.

Figure 4-6. RHN Configuration

12. The **RHN Configuration** page enables you to change the way the Satellite communicates with Red Hat Network. You may alter the Satellite's hostname and the location, or mountpoint of the package repository. Typically, the defaults will do. If you intend to monitor systems with this Satellite, select both the **Enable monitoring backend** and **Enable monitoring scout** checkboxes.

In addition, this page allows you to configure the Satellite to use an HTTP proxy server. To do this, complete all associated fields. Note that references to protocol such as `http://` or `https://` should not be included in the **HTTP proxy server** field. Insert only the hostname and port in the form `hostname:port`, such as `my.corporate.gateway.example.com:3128`. When finished, click **Continue**. The **Monitoring Configuration** page appears.

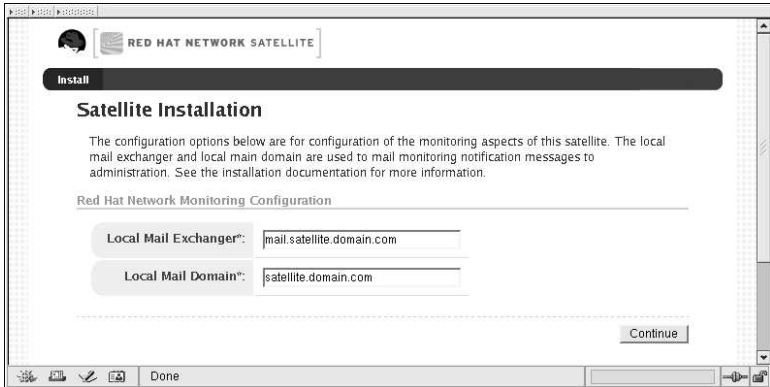


Figure 4-7. Monitoring Configuration

13. The **Monitoring Configuration** page captures email routing information used in monitoring. This is required only if you intend to receive alert notifications from probes. If you do, provide the mail server (exchanger) and domain to be used. Note that **sendmail** must be configured to handle email redirects of notifications. Refer to Section 4.3 *Sendmail Configuration* for instructions. When finished, click **Continue**. The **RHN Registration** page appears.

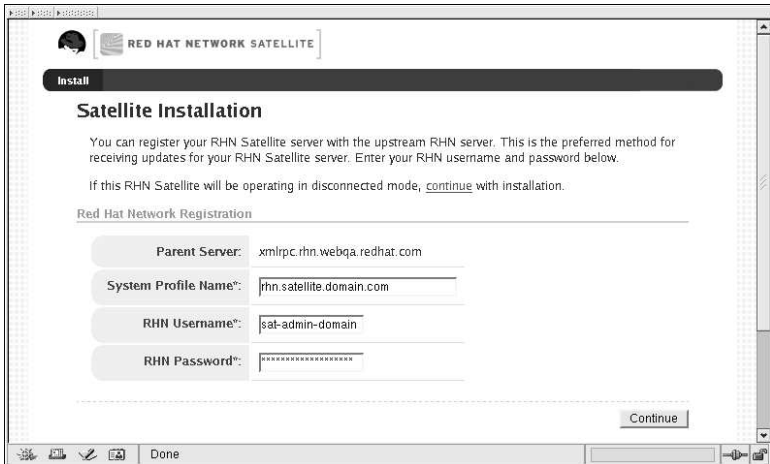


Figure 4-8. RHN Registration

14. The **RHN Registration** page enables you to register the Satellite with Red Hat Network, allowing it to get updates and software channel package data directly. To register the Satellite, ensure its system profile name is correct (usually the hostname) and complete the **RHN Username** and **RHN Password** fields with the account information provided by your sales representative or established previously by you. This account must be entitled for RHN Satellite Server.

To skip this step, such as for Satellites that will operate in disconnected mode, click either the **continue** link or button. If you do not register the Satellite, the **RHN Satellite Synchronization Tool** cannot be used to populate software channels. Contact your Red Hat representative to obtain the packages and updates manually. When finished, click **Continue**. The **RHN Satellite Entitlement Certificate** page appears.

RED HAT NETWORK SATELLITE

Install

Satellite Installation

You must provide an RHN Satellite certificate. This certificate entitles you to the various levels of service provided by the RHN Satellite.

Red Hat Network Satellite Certificate

Upload Certificate File:

or:
Certificate Text:

Done

Figure 4-9. RHN Satellite Entitlement Certificate

15. The **RHN Satellite Entitlement Certificate** page gathers your RHN Entitlement Certificate either by obtaining its location or collecting its contents. To identify the certificate's path, click **Browse**, navigate to the file, and select it. To input its contents, open your certificate in a text editor, copy all lines, and paste them directly into the large text field at the bottom. Red Hat recommends using the file locator as it's less error prone. Click **Validate Certificate** to continue. If you receive errors related to DNS, ensure your Satellite is configured correctly. Refer to Section 7.3 *Host Not Found/Could Not Determine FQDN*. The **Satellite Synchronization** page appears next.

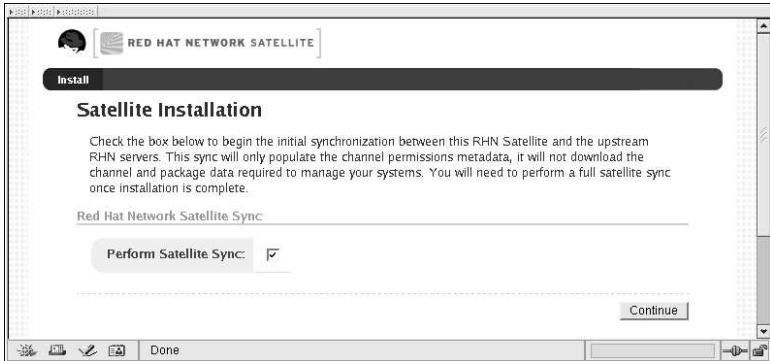


Figure 4-10. Satellite Synchronization

16. The **Satellite Synchronization** page allows you to initially populate your Satellite with software channel metadata. This is possible during installation only if you chose to register your Satellite with RHN. To synchronize, select the **Perform Satellite Sync** checkbox and click **Continue**. After the installation, you will still need to populate the channels with packages. Refer to Chapter 6 *Importing and Synchronizing* for instructions. The **SSL Certificate** page appears next.

The screenshot shows a web browser window titled "RED HAT NETWORK SATELLITE" with a sub-header "Install". The main heading is "Satellite Installation". Below this, there is explanatory text about SSL certificates and a link to "continue" if the user does not want to use SSL authentication. The main section is titled "Satellite Certificate Generation" and contains a form with the following fields:

- CA cert password*: [password field]
- Re-enter CA cert password*: [password field]
- Organization*: [Domain Corp.]
- Organizational Unit: [Engineering]
- CA Cert Common Name*: [eng.domain.com]
- Email Address*: [sat-admin@domain.com]
- City*: [Raleigh]
- State*: [NC]
- Country*: [United States] (dropdown menu)
- CA Cert Expiration (years)*: [32]
- Server Cert Expiration (years)*: [5]

At the bottom right of the form is a "Generate Cert" button. The browser's status bar at the bottom shows "Done".

Figure 4-11. SSL Certificate

17. The **SSL Certificate** page collects information necessary to create the Secure Sockets Layer (SSL) certificate used by the Satellite and its client machines. In addition, you may manage your SSL infrastructure using the **RHN SSL Maintenance Tool**. Refer to the SSL Certificates chapter of the *RHN Client Configuration Guide* for instructions.

Create an SSL Certificate Authority (CA) password and complete the rest of the fields with your and your organization's information. As always, ensure this information exists on the backups of login information described in Chapter 2 *Requirements*. The **CA Cert Common Name** field may already be populated with the name of the host machine. This may need to be altered if you're using multiple RHN Servers in tandem.

Use the **Expiration** fields at the bottom to establish usage limits for the Certificate Authority and the certificate. The public certificate will be placed in the `/var/www/html/pub/` directory on the Satellite where it can be downloaded from and installed on all client systems. Once finished, click **Generate Cert**. The **Bootstrap Script** page appears next.

RED HAT NETWORK SATELLITE

Install

Satellite Installation

The following information will be used to generate bootstrap scripts. These bootstrap scripts can be used to configure a client to use this RHN Satellite to receive updates. Once the bootstrap scripts have been generated, they will be available from [this server](#). Please note that some manual configuration of these scripts may still be required.

Generate Bootstrap Scripts

Satellite server hostname*:

SSL cert location*:

Enable SSL: ☒

Enable Client GPG checking: ☒

Enable Remote Configuration: ☒

Enable Remote Commands: ☒

Client HTTP proxy:

Client HTTP proxy username:

Client HTTP proxy password:

Generate Bootstrap Script

Done

Figure 4-12. Bootstrap Script

18. The **Bootstrap Script** page allows you to create a script for redirecting client systems from the central RHN Servers to the Satellite. This script, to be placed in the `/var/www/html/pub/bootstrap/` directory of the Satellite, significantly reduces the effort involved in reconfiguring all systems, which by default obtain packages from the central RHN Servers. The required fields are prepopulated with values derived from previous installation steps. Ensure this information is accurate.

Checkboxes offer options for including built-in security SSL and GNU Privacy Guard (GPG) features, both of which are advised. In addition, you may enable remote command acceptance and remote configuration management of the systems to be bootstrapped here. Both features are useful for completing client configuration. Finally, if you are using an HTTP proxy server, complete the related fields. When finished, click **Generate Bootstrap Script**. The **Installation Complete** page appears.

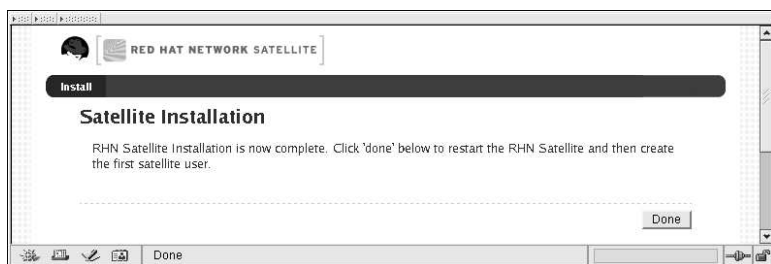


Figure 4-13. Installation Complete

19. The **Installation Complete** page marks the end of the initial Satellite installation and configuration. Click **Complete** to reboot the system and create the Satellite Administrator account. The **Satellite Restart** page appears.

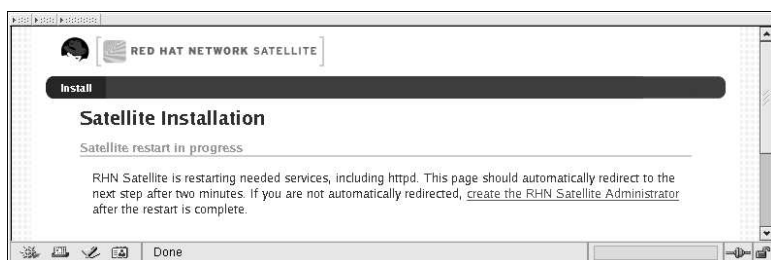


Figure 4-14. Satellite Restart

20. The **Satellite Restart** page requires no user input and merely provides a placeholder while the system is rebooted. Once finished, the browser window is redirected to the **Satellite Administrator** page.

Install

Create Satellite Administrator

Create the RHN Satellite Administrator account. This account will have access to all resources on this RHN Satellite. This account will also be able to create new users and delegate permissions to them.

Login:

Desired Login*:

Desired Password*:

Confirm Password*:

Account Information:

First, Last Name*:

Email*:

* - Required Field

[Create Login](#)

Figure 4-15. Satellite Administrator

21. The **Satellite Administrator** page enables you to create the Organization Administrator account on the Satellite. This master account can conduct any task available to all other user levels, as well as create other user accounts. As always, ensure this information exists on the backups of login information described in Chapter 2 *Requirements*. When finished, click **Create Login**. The **Account Created** page appears.

RED HAT NETWORK SATELLITE

LOGGED IN: sat-admin [SIGN OUT](#)

[Your RHN](#) [Systems](#) [Errata](#) [Channels](#) [Schedule](#) [Users](#) [Monitoring](#) [Satellite Tools](#) [Help](#)

NO SYSTEMS SELECTED

RHN Satellite Administrator Account Created

The installation of this RHN Satellite server has been completed, and you are the Satellite administrator.

Please consult the Reference Guides in the Help Section for how to use your new RHN Satellite.

Figure 4-16. Account Created

22. The **Account Created** page signals the end of the installation and configuration process. You may now begin to import software packages and reconfigure client systems to use the Satellite. Refer to Chapter 6 *Importing and Synchronizing* and the *RHN Client Configuration Guide* (available under **Help**) respectively, for instructions.

4.3. Sendmail Configuration

If your RHN Satellite Server will serve Monitoring-entitled systems and you wish to acknowledge via email the alert notifications you receive, you must configure **sendmail** to properly handle incoming mail. This is required by the email redirect feature, which allows you to stop notifying users about a Monitoring-related event with a single reply.



Important

Some more restrictive corporate mail configurations will not allow mail to be sent from an address that is not recognized as valid. Therefore, it may be necessary to configure **rogerthat01@maildomain** as a valid email address in your corporate environment. Check with your mail systems administrator.

To configure **sendmail** correctly, run the following commands as root. First, create a symbolic link allowing sendmail to run the notification enqueuer with the following command:

```
ln -s /opt/notification/scripts/ack_enqueuer.pl /etc/smrsh/.
```

Next, edit the `/etc/aliases` file on the mail server and add the following line:

```
rogerthat01: | /etc/smrsh/ack_enqueuer.pl
```

Next, edit the `/etc/mail/sendmail.mc` file and change:

```
"DAEMON_OPTIONS('Port=smtp,Addr=127.0.0.1, Name=MTA')dnl"
```

to:

```
"DAEMON_OPTIONS('Port=smtp, Name=MTA')dnl"
```

Then, have the alias processed like so:

```
newaliases
```

Finally, update the `sendmail-cf` package:

```
up2date sendmail-cf
```

Note, disconnected installs will need to obtain this package from the ISO.

Restart sendmail:

```
service sendmail restart
```

4.4. MySQL Installation

This sections is applicable only if your RHN Satellite Server will serve Monitoring-entitled systems and you wish to run **MySQL** probes against them. Refer to the Probes appendix of the *RHN Reference Guide* for a list of available probes.

If you do wish to run **MySQL** probes, subscribe the Satellite to the Red Hat Enterprise Linux AS Extras channel and install the `mysql-server` package either through the RHN website or `up2date`.

Two extra packages will also get downloaded in the transaction. These are needed for the `mysql-server` package to be installed and run successfully. Once finished, your Satellite may be used to schedule **MySQL** probes.

Entitlements

The RHN Satellite Server, like RHN itself, provides all services to customers through the setting of entitlements. For RHN, entitlements are purchased by customers as needed; however, for RHN Satellite Server, entitlements are contractually agreed-upon beforehand, and they are set at installation time. All *public* channels are automatically available; The private channels that should also be made available through the Satellite are determined by the *RHN Entitlement Certificate*.

The RHN Entitlement Certificate, which contains the precise set of entitlements attributed to your organization, is provided by your Red Hat representative. Red Hat reserves the right to compare the contents of that RHN Entitlement Certificate with the database's entitlement settings at any time to ensure compliance with the terms of the customer's contract with Red Hat.

The steps referenced in this section are typically carried out by the **RHN Satellite Server Installation Program** itself and do not need to be repeated during initial installation. Instead, they are listed here for use by customers who have received a new RHN Entitlement Certificate, such as one reflecting an increase in the number of entitlements.

5.1. Receiving the Certificate

The RHN Entitlement Certificate is an XML document that looks something like this:

```
<?xml version="1.0" encoding="UTF-8"?>
<rhncert version="0.1">
  <rhncert-field name="product">RHN-SATELLITE-001</rhncert-field>
  <rhncert-field name="owner">Clay's Precious Satelliten</rhncert-field>
  <rhncert-field name="issued">2005-01-11 00:00:00</rhncert-field>
  <rhncert-field name="expires">2005-03-11 00:00:00</rhncert-field>
  <rhncert-field name="slots">30</rhncert-field>
  <rhncert-field name="provisioning-slots">30</rhncert-field>
  <rhncert-field name="nonlinux-slots">30</rhncert-field>
  <rhncert-field name="channel-families" quantity="10" family="rhel-cluster"/>
  <rhncert-field name="channel-families" quantity="30" family="rhel-ws-extras"/>
  <rhncert-field name="channel-families" quantity="10" family="rhel-gfs"/>
  <rhncert-field name="channel-families" quantity="10" family="rhel-es-extras"/>
  <rhncert-field name="channel-families" quantity="40" family="rhel-as"/>
  <rhncert-field name="channel-families" quantity="30" family="rhncert-tools"/>
  <rhncert-field name="satellite-version">3.6</rhncert-field>
  <rhncert-field name="generation">2</rhncert-field>
  <rhncert-signature>
-----BEGIN PGP SIGNATURE-----
Version: Crypt::OpenPGP 1.03

iQBGBAARAwAGBQJCAG7yAAoJEJ5yna8G1HkysOkAn07qmlUrkGKs7/5yb8H/nboG
mhHkAJ9wdmqOeKfcBa3IUDL53oNMEBP/dg==
=0Kv7
-----END PGP SIGNATURE-----
  </rhncert-signature>
</rhncert>
</computeroutput>
</screen>
```

**Note**

Do not try to use this RHN Entitlement Certificate; it is just an example.

The initial RHN Entitlement Certificate is generated by a member of the RHN team and emailed to a consultant or customer prior to an install. This process helps guarantee that we do not inadvertently install any RHN Satellite Servers that the RHN team does not know about.

Save the XML file to the Satellite machine in preparation for activation.

5.2. Uploading the RHN Entitlement Certificate

If your RHN Satellite Server is connected to the Internet, you have the option of uploading your new RHN Entitlement Certificate through the RHN website. To do this:

1. Log into <https://rhn.redhat.com> with your organization's Satellite-entitled account.
2. Click **Systems** in the top navigation bar and then the name of the RHN Satellite Server. You may also find the Satellite through the Satellite line item within the **Channels** category.
3. In the **System Details** page, click the **Satellite** subtab and examine the existing certificate. Ensure you have a backup of this file by copying and pasting its contents into a text editor.
4. Click **Deactivate Satellite License** at the bottom of the page. Then click **Confirm Deactivation**. You will receive a message describing the deactivation at the top of the page.
5. You may then browse to the location of your new RHN Entitlement Certificate or paste its contents into the text field provided. When done, click **Update Certificate**.

Your Satellite now has access to additional channels and client entitlements outlined in the new certificate. You may now synchronize it with the central RHN Servers. Refer to Chapter 6 *Importing and Synchronizing*.

5.3. Managing the RHN Certificate with RHN Satellite Activate

For disconnected Satellites or customers who prefer to work locally, Red Hat provides a command line tool for managing your RHN Entitlement Certificate and activating the Satellite using that certificate: **RHN Satellite Activate** (`rhn-satellite-activate`). This is included with the Satellite installation as part of the `rhns-satellite-tools` package.

5.3.1. Command Line Entitlement Options

The `rhn-satellite-activate` tool offers a handful of command line options for activating a Satellite using its RHN Entitlement Certificate:

Option	Description
<code>-h, --help</code>	Display the help screen with a list of options.
<code>--sanity-only</code>	Confirm certificate sanity. Does not activate the Satellite locally or remotely.
<code>--disconnected</code>	Activates locally but not on remote RHN Servers.
<code>--rhn-cert=/PATH/TO/CERT</code>	Uploads new certificate and activates the Satellite based upon the other options passed (if any).

Option	Description
<code>--systemid=/PATH/TO/SYSTEMID</code>	<i>For testing only</i> - Provides an alternative system ID by path and file. The system default is used if not specified.
<code>--no-ssl</code>	<i>For testing only</i> - Disable SSL.

Table 5-1. RHN Entitlement Certificate Options

To use these options, insert the option and the appropriate value, if needed, after the `rhn-satellite-activate` command. Refer to Section 5.3.2 *Activating the Satellite*.

5.3.2. Activating the Satellite

You should use the options in Table 5-1 to accomplish the following tasks in this order:

1. Validate the RHN Entitlement Certificate's sanity (or usefulness).
2. Activate the Satellite locally by inserting the RHN Entitlement Certificate into the local database.
3. Activate the Satellite remotely by inserting the RHN Entitlement Certificate into the central RHN (remote) database. This is typically accomplished during local activation but may require a second step if you chose the `--disconnected` option.

Here are some examples depicting use of the tool and these options.

To validate an RHN Entitlement Certificate's sanity only:

```
rhn-satellite-activate --sanity-only --rhn-cert=/path/to/demo.xml
```

To validate an RHN Entitlement Certificate and populate the local database:

```
rhn-satellite-activate --disconnected --rhn-cert=/path/to/demo.xml
```

To validate an RHN Entitlement Certificate and populate both the local and the RHN database:

```
rhn-satellite-activate --rhn-cert=/path/to/demo.xml
```

Once you run this final command, the Satellite is running and able to serve packages locally and synchronize with the central RHN Servers. Refer to Chapter 6 *Importing and Synchronizing*.

Importing and Synchronizing

After installing the RHN Satellite Server, you must provide it the packages and channels to be served. This chapter explains how to import that data and keep it up-to-date.

6.1. RHN Satellite Synchronization Tool

With the Satellite installation, Red Hat Network provides an application designed specifically to import and synchronize data - the **RHN Satellite Synchronization Tool**. This tool, which comes with the `rhns-satellite-tools` package, enables an RHN Satellite Server to update its database metadata and RPM packages with that of Red Hat. To launch it, as root execute the command:

```
satellite-sync
```

The tool can be used in a closed environment, such as the one created with a disconnected install, or it may obtain data directly over the Internet. For disconnected importing and synchronization, local media in the form of Red Hat Network Channel Content ISOs are required. After installing and mounting the discs, the sole difference in use will be the addition of the `--mount-point` option and path to the files appended to every command. This will be covered in more detail in a moment.

6.1.1. Import/Sync Steps

The **RHN Satellite Synchronization Tool** works incrementally, or in steps. For it to obtain Errata information, it must first know the packages contained. For the packages to be updated, the tool must first identify the associated channel(s). For this reason, the **RHN Satellite Synchronization Tool** performs its actions in the following order:

1. `channel-families` — Import/synchronize channel family (architecture) data.
2. `channels` — Import/synchronize channel data.
3. `rpms` — Import/synchronize RPMs.
4. `packages` — Import/synchronize full package data for those RPMs retrieved successfully.
5. `errata` — Import/synchronize Errata information.

Each of these steps can be initiated individually for testing purposes with the effect of forcing the tool to stop when that step is complete. All steps that precede it, however, will have taken place. Therefore, calling the `rpms` step will automatically ensure the `channels` and `channel-families` steps take place first. To initiate an individual step, use the `--step`, like so:

```
satellite-sync --step=rpms
```

6.1.2. Import/Sync Options

In addition to `--step` the **RHN Satellite Synchronization Tool** offers many other command line options. To use them, insert the option and the appropriate value after the `satellite-sync` command when launching import/synchronization.

Option	Description
Option	Description
<code>-h, --help</code>	Display this list of options and exit.
<code>-d=, --db=DB</code>	Include alternate database connect string: <code>username/password@SID</code> .
<code>-m=, --mount-point=MOUNT_POINT</code>	Import/sync from local media mounted to the Satellite. To be used in closed environments (such as those created during disconnected installs).
<code>--list-channels</code>	List all available channels and exit.
<code>-c=, --channel=CHANNEL_LABEL</code>	Process data for this channel only. Multiple channels can be included by repeating the option. If no channels are specified, all channels on the Satellite will be freshened.
<code>-p, --print-configuration</code>	Print the current configuration and exit.
<code>--no-ssl</code>	<i>Not Advisable</i> - Turn off SSL.
<code>--step=STEP_NAME</code>	Perform the sync process <i>only</i> to the step specified. Typically used in testing.
<code>--no-rpms</code>	Do not retrieve actual RPMs.
<code>--no-packages</code>	Do not process full package data.
<code>--no-errata</code>	Do not process Errata information.
<code>--no-kickstarts</code>	Do not process kickstart data (provisioning only).
<code>--force-all-packages</code>	Forcibly process all package data without conducting a diff.
<code>--cache-refresh-level=LEVEL_NUMBER</code>	The level of caching refresh for the Satellite, 0-6. Refer to Section 6.1.3 <i>Import/Sync Cache Refresh</i> for a complete description.
<code>--debug-level=LEVEL_NUMBER</code>	Override the amount of messaging sent to log files and generated on the screen set in <code>/etc/rhn/rhn.conf</code> , 0-6 (2 is default).
<code>--email</code>	Email a report of what was imported/synchronized to the designated recipient of traceback email.
<code>--traceback-mail=TRACEBACK_MAIL</code>	Direct sync output (from <code>--email</code>) to this email address.
<code>-s=, --server=SERVER</code>	Include the hostname of an alternative server to connect to for synchronization.
<code>--http-proxy=HTTP_PROXY</code>	Add an alternative HTTP proxy server in the form <code>hostname:port</code> .
<code>--http-proxy-username=HTTP_PROXY_USERNAME</code>	Include the username for the alternative HTTP proxy server.
<code>--http-proxy-password=HTTP_PROXY_PASSWORD</code>	Include the password for the alternative HTTP proxy server.

Option	Description
<code>--ca-cert=CA_CERT</code>	Use an alternative SSL CA certificate by including the full path and filename.
<code>--systemid=SYSTEM_ID</code>	<i>For debugging only</i> - Include path to alternative digital system ID.
<code>--systemid=SYSTEM_ID</code>	<i>For debugging only</i> - Include path to alternative digital system ID.
<code>--batch-size=BATCH_SIZE</code>	<i>For debugging only</i> - Set maximum batch size in percent for XML/database-import processing. Open man satellite-sync for more information.

Table 6-1. Satellite Import/Sync Options

If no options are included, `satellite-sync` will synchronize all channels that already exist in the Satellite's database. By default, the `--cache-refresh-level=2` and `--step` (all steps) options are enabled.

Keep in mind, when using the `--channel` option, you must specify the channel label, not its name. For instance, use "rhel-i386-as-3" not "Red Hat Enterprise Linux 3 i386." Use the `--list-channels` option to obtain a list of all channels by label. All of these channels are available for importing and synchronizing.

6.1.3. Import/Sync Cache Refresh

The **RHN Satellite Synchronization Tool** caches metadata used for the synchronization process. This cache, which exists by default in `/var/cache/rhn/`, can be completely refreshed every time the process is run, be partially refreshed, or be left in place entirely. The closer to a full refresh, the slower the synchronization process.

The default setting is a cache refresh level of 2. This can be adjusted using the `--cache-refresh-level` option. In the event that `satellite-sync` is called many times in a short period of time, level 0 may be more appropriate. Here are the levels:

- 0 — Do not refresh unless something differs.
- 1 — Delete staging area so all short (indexing) package data is downloaded every time.
- 2 — Default behavior - Obtain short (indexing) package data and long package data.
- 3 — Always replace Errata information.
- 4 — Remove all caches upon sync completion.
- 5 — Remove all caches upon sync initialization.
- 6 — Remove all caches upon sync completion and initialization.

Increasing the cache level is useful in troubleshooting. If users suspect the cache is out of sync or corrupt, they may increase the level incrementally in order to completely remove it and start anew. Refer to Section 7.5 *Caching Issues* for manual clearing instructions.

6.2. Importing

Before distributing packages via RHN Satellite Server, the packages must first be uploaded to the Satellite. This section describes the process for importing packages and other channel data.



Important

To populate custom channels correctly, you must first populate at least one Red Hat base channel. The **RHN Satellite Synchronization Tool** creates the necessary directory structures and permissions; without these, the custom channel tools will not work properly. For this reason, you should use these instructions to set up your base channel(s) and then refer to the *RHN Channel Management Guide* for steps to establish custom channels.

6.2.1. Prerequisites

To perform the RHN Satellite Server import, the following prerequisites must be met:

- The RHN Satellite Server installation must have been performed successfully.
- The Red Hat Network Channel Content ISOs must be available, or the Satellite must have access to the Internet and the RHN website.

6.2.2. Preparing for Import

Although it is possible to conduct the import directly from the RHN website, this should be done only if Channel Content ISOs are not available. It takes a long time to populate a channel from scratch over the Internet. For this reason, Red Hat urges you to use ISOs, if they are available, for initial import.

Channel Content ISOs are special collections that contain both packages and XML dumps of metadata. The ISO images can be downloaded from the RHN website on a machine connected to the Internet and then transferred to the Satellite. After logging in, click **Channels** in the top navigation bar and then the name of the channel for your version of RHN Satellite Server. Click the **Downloads** tab and use the instructions on the page to obtain the Channel Content ISOs, available by version of Red Hat Enterprise Linux. If the desired Channel Content ISOs don't appear, ensure your RHN Entitlement Certificate has been uploaded to RHN and correctly identifies the target channels.

Channel Content ISOs are mounted and then copied to a temporary repository directory. Before mounting the ISOs, ensure the temporary repository has enough disk space to copy all the contents into a single directory. For a single channel, the approximate required space is 3 GB. The process to copy Channel Content ISOs is to mount each one, copy its contents to the temporary repository, and then unmount the ISO. Repeat. Each channel consists of several ISOs. Once finished, the administrator should delete the temporary directory and all of its contents. Follow these steps:

1. Log into the machine as root.
2. Insert the first Channel Content ISO that has been burned to disc.
3. Create a directory in `/mnt` to store the file(s) with the command:

```
mkdir /mnt/import
```
4. Mount the ISO file from within the directory containing it using the command:

```
mount iso_filename /mnt/import -o loop
```
5. Create a target directory for the files, such as:

```
mkdir /var/rhn-sat-import/
```
6. This sample command assumes the administrator wants to copy the contents of the ISO (mounted in `/mnt/import`) into `/var/rhn-sat-import/`:

```
cp -ruv /mnt/import/* /var/rhn-sat-import/
```
7. Then unmount `/mnt/import` in preparation for the next CD or ISO:

```
umount /mnt/import/
```
8. Repeat these steps for each Channel Content ISO of every channel to be imported.

6.2.3. Running the Import

The `rhns-satellite-tools` package provides the `satellite-sync` program for managing all package, channel, and errata imports and synchronizations.

The following process assumes in the previous step the user has copied all data to `/var/rhn-sat-import`.

**Note**

The trailing backslash (\) in all subsequent command examples is a continuation character; it may safely be omitted. Long versions of all options are used in the examples for clarity. You may use short versions where available.

The first step in importing channels into the database is listing the channels available for import. This is accomplished with the command:

```
satellite-sync --list-channels --mount-point /var/rhn-sat-import
```

The next step is to initiate the import of a specific channel. Do this using a channel label presented in the previous list. The command will look like:

```
satellite-sync -c rhel-i386-as-3 --mount-point /var/rhn-sat-import
```

**Note**

Importing package data can take up to two hours per channel. But you may begin registering systems to channels as soon as they appear in the RHN Satellite Server's website. No packages are necessary for registration, although updates cannot be retrieved from the Satellite until the channel is completely populated.

You may repeat this step for each channel or include them all within a single command by passing each channel label preceded by an additional `-c` flag, like so:

```
satellite-sync -c channel-label-1 -c channel-label-1 --mount-point /var/rhn-sat-import
```

This conducts the following tasks in this order:

1. Populating the tables describing common features for channels (*channel families*). This can also be accomplished individually by passing the `--step=channel-families` option to `satellite-sync`.
2. Creating a particular channel in the database and importing the metadata describing the channel. Individually, use the `--step=channels` option.
3. Moving the RPM packages from the temporary repository into their final location. Individually, use the `--step=rpms` option.
4. Parsing the header metadata for each package in the channel, uploading the package data, and associating it with the channel. Individually, use the `--step=packages` option.
5. Identifying Errata associated with the packages and including them in the repository. Individually, use the `--step=errata` option.

After running the preceding sample command, the population of the channel should be complete. All of the packages should have been moved out of the repository; this can be verified with the command `cd /var/rhn-sat-import/; ls -alR | grep rpm`. If all RPMs have been installed and moved to their permanent locations, then this count will be zero, and the administrator may safely remove the temporary repository (in this case, `/var/rhn-sat-import/`).

6.3. Synchronizing

An update channel is only as useful as the freshness of the information in that channel. Since the RHN Satellite Server is designed to be a standalone environment, any update advisories published by RHN must be manually imported and synchronized by the administrator of the RHN Satellite Server.

During synchronization over the Internet, the **RHN Satellite Synchronization Tool** performs the following steps:

1. Connects over SSL to central RHN Servers, authenticates itself as an RHN Satellite Server, and triggers an export of RHN data — *unless* a local mount point for RHN-exported data is specified, in which case no connection is necessary. Refer to Section 6.3.2 *Synchronizing Errata and Packages via Local Media* for an explanation.
2. Examines the export and identifies differences between the RHN Satellite Server data set and the exported RHN data set. For a particular channel, the following information is analyzed:
 - Channel metadata
 - Metadata of all packages in that channel
 - Metadata for all Errata that affect that channel



Note

All analysis is performed on the RHN Satellite Server; the central RHN Servers deliver only an export of its channel information and remain ignorant of any details regarding the RHN Satellite Server.

3. After the analysis of the export data, any differences are imported into the RHN Satellite Server database. Please note that importing new packages may take variable lengths of time. For a large update, an import can take many hours.

The `satellite-sync` command can be used in two modes: via RHN and via local media.

6.3.1. Synchronizing Errata and Packages Directly via RHN

For customers who want to sync data as frequently as possible and who can initiate connections outside of their own environments, the `satellite sync` can be run over the Internet through SSL. This is the default setting for the `satellite sync` script. For example:

```
satellite-sync -c rhel-i386-as-3
```

This connects to central Red Hat Network Servers and performs the process described above. Multiple channels can be included by repeating the option. If no channels are specified, all channels on the Satellite will be refreshed.

6.3.2. Synchronizing Errata and Packages via Local Media

For customers who cannot connect their Satellite directly to RHN, Red Hat recommends downloading Channel Content ISOs to a separate, Internet-connected system and then transferred to the Satellite. Refer to Section 6.2.2 *Preparing for Import* for instructions on downloading the ISOs. For ease of import, we recommend that the data be copied from media directly into a common repository through a command such as the following:

```
cp -rv /mnt/cdrom/* /var/rhn-sat-sync/
```

Then, the following command:

```
satellite-sync -c rhel-i386-as-3 --mount-point /var/rhn-sat-sync
```

This can be used to perform the sync process described above, using the dump files in `/var/rhn-sat-sync` to perform the necessary comparisons and imports. See Section 6.2.3 *Running the Import* for precise steps.

This chapter provides tips for determining the cause of and resolving the most common errors associated with RHN Satellite Server. If you need additional help, contact Red Hat Network support at <https://rhn.redhat.com/help/contact.pxt>. Log in using your Satellite-entitled account to see your full list of options.

In addition, you may package configuration information and logs from the Satellite and send them to Red Hat for further diagnosis. Refer to Section 7.6 *Satellite Debugging by Red Hat* for instructions.

7.1. Log Files

Virtually every troubleshooting step should start with a look at the associated log file or files. These provide invaluable information about the activity that has taken place on the device or within the application that can be used to monitor performance and ensure proper configuration. See Table 7-1 for the paths to all relevant log files:

Component/Task	Log File Location
Apache HTTP Server	/var/log/httpd/ directory
RHN Satellite Server	/var/log/rhn/ directory
RHN Satellite Server Installation Program	/var/log/rhn_satellite_install.log
Database installation - <i>Embedded Database</i>	/var/log/rhn/rhn-database-installation.log
Database population	/var/log/rhn/populate_db.log
RHN Satellite Synchronization Tool	/var/log/rhn/rhn_server_satellite.log
Monitoring infrastructure	/home/nocpulse/var/ directory
Monitoring notifications	/opt/notification/var/ directory
RHN DB Control - <i>Embedded Database</i>	/var/log/rhn_database.log
RHN Task Engine (taskomatic)	/var/log/messages
Red Hat Update Agent	/var/log/up2date
XML-RPC transactions	/var/log/rhn/rhn_server_xmlrpc.log

Table 7-1. Log Files

7.2. General Problems

To begin troubleshooting general problems, examine the log file or files related to the component exhibiting failures. A useful exercise is to tail all log files and then run `up2date --list`. You should then examine all new log entries for potential clues.

A common issue is full disk space. An almost sure sign of this is the appearance of halted writing in the log files. If logging stopped during a write, such as mid-word, you likely have filled disks. To confirm this, run this command and check the percentages in the Use% column:

```
df -h
```

In addition to log files, you can obtain valuable information by retrieving the status of your RHN Satellite Server and its various components. This can be done with the command:

```
service rhn-satellite status
```

In addition, you can obtain the status of components such as the Apache HTTP Server and the **RHN Task Engine** individually. For instance, to view the status of the Apache HTTP Server, run the command:

```
service httpd status
```

If the Apache HTTP Server isn't running, entries in your `/etc/hosts` file may be incorrect. Refer to Section 7.3 *Host Not Found/Could Not Determine FQDN* for a description of this problem and possible solutions.

To obtain the status of the **RHN Task Engine**, run the command:

```
service taskomatic status
```

For more information, see Section 8.7.1.1 *Maintaining the RHN Task Engine*.

To obtain the status of the Satellite's Embedded Database, if it exists, run the command:

```
service rhn-database status
```

To determine the version of your database schema, run the command:

```
rhn-schema-version
```

To derive the character set types of your Satellite's database, run the command:

```
rhn-charsets
```

If the administrator isn't getting email from the RHN Satellite Server, confirm the correct email addresses have been set for `traceback_mail` in `/etc/rhn/rhn.conf`.

If the traceback mail is marked from `dev-null@rhn.redhat.com` and you would like the address to be valid for your organization, include the `web.default_mail_from` option and appropriate value in `/etc/rhn/rhn.conf`.

If importing/synchronizing a channel fails and you can't recover it in any other way, run this command to delete the cache:

```
rm -rf temporary-directory
```

Note that Section 6.2.2 *Preparing for Import* suggested this temporary directory be `/var/rhn-sat-import/`.

Then restart the importation or synchronization.

7.3. Host Not Found/Could Not Determine FQDN

Because RHN configuration files rely exclusively on fully qualified domain names (FQDN), it is imperative key applications are able to resolve the name of the RHN Satellite Server into an IP address. **Red Hat Update Agent**, **Red Hat Network Registration Client**, and the Apache HTTP Server are particularly prone to this problem with the RHN applications issuing errors of "host not found" and

the Web server stating "Could not determine the server's fully qualified domain name" upon failing to start.

This problem typically originates from the `/etc/hosts` file. You may confirm this by examining `/etc/nsswitch.conf`, which defines the methods and the order by which domain names are resolved. Usually, the `/etc/hosts` file is checked first, followed by Network Information Service (NIS) if used, followed by DNS. One of these has to succeed for the Apache HTTP Server to start and the RHN client applications to work.

To resolve this problem, identify the contents of the `/etc/hosts` file. It may look like this:

```
127.0.0.1    this_machine.example.com this_machine localhost.localdomain.com localhost
```

First, in a text editor, remove the offending machine information, like so:

```
127.0.0.1    localhost.localdomain.com localhost
```

Then, save the file and attempt to re-run the RHN client applications or the Apache HTTP Server. If they still fail, explicitly identify the IP address of the Satellite in the file, such as:

```
127.0.0.1    localhost.localdomain.com localhost
123.45.67.8  this_machine.example.com this_machine
```

Replace the value here with the actual IP address of the Satellite. This should resolve the problem. Keep in mind, if the specific IP address is stipulated, the file will need to be updated when the machine obtains a new address.

7.4. Connection Errors

A common connection problem, indicated by `SSL_CONNECT` errors, is the result of a Satellite being installed on a machine whose time had been improperly set. During the Satellite installation process, SSL certificates are created with inaccurate times. If the Satellite's time is then corrected, the certificate start date and time may be set in the future, making it invalid.

To troubleshoot this, check the date/time on clients and the Satellite with the following command:

```
date
```

The results should be nearly identical for all machines and within the "notBefore" and "notAfter" validity windows of the certificates. Check the client certificate dates and times with the following command:

```
openssl x509 -dates -noout -in /usr/share/rhn/RHN-ORG-TRUSTED-SSL-CERT
```

Check the Satellite server certificate dates and times with the following command:

```
openssl x509 -dates -noout -in /etc/httpd/conf/ssl.crt/server.crt
```

By default, the server certificate has a one-year life while client certificates are good for 10 years. If you find the certificates are incorrect, you can either wait for the valid start time, if possible, or create new certificates, preferably with all system times set to GMT.

The following measures can be used to troubleshoot general connection errors:

- Attempt to connect to the RHN Satellite Server's database at the command line using the correct connection string as found in `/etc/rhn/rhn.conf`:

```
sqlplus username/password@sid
```

- Ensure the RHN Satellite Server is using Network Time Protocol (NTP) and set to the appropriate time zone. This also applies to all client systems and the separate database machine in RHN Satellite Server with Stand-Alone Database.
- Confirm the correct `rhn-org-httpd-ssl-key-pair-MACHINE_NAME-VER-REL.noarch.rpm` is installed on the RHN Satellite Server and the corresponding `rhn-org-trusted-ssl-cert-*.noarch.rpm` or raw CA SSL (client) certificate is installed on all client systems.
- Verify the client systems are configured to use the appropriate certificate.
- If also using one or more RHN Proxy Servers, ensure each Proxy's SSL certificates are prepared correctly. The Proxy should have both its own server SSL key-pair and CA SSL (client) certificate installed, since it will serve in both capacities. Refer to the SSL Certificates chapter of the *RHN Client Configuration Guide* for specific instructions.
- Make sure client systems are not using firewalls of their own blocking required ports, as identified in Section 2.4 *Additional Requirements*.

7.5. Caching Issues

If importing or synchronizing fails, and it isn't related to connection errors, you should consider clearing the cache. By default, the cache is located in `/var/cache/rhn/`. To clear it manually, issue the command:

```
rm -fv /var/cache/rhn/*
```

In addition, you may set the cache refresh level for all importing and synchronizing using the `--cache-refresh-level` option of `satellite-sync`. Setting this to its highest level removes the cache entirely upon initialization and closure. Refer to Section 6.1.3 *Import/Sync Cache Refresh* for information on the available levels.

7.6. Satellite Debugging by Red Hat

If you've exhausted these troubleshooting steps or want to defer them to Red Hat Network professionals, Red Hat recommends you take advantage of the strong support that comes with RHN Satellite Server. The most efficient way to do this is to aggregate your Satellite's configuration parameters, log files, and database information and send this package directly to Red Hat.

RHN provides a command line tool explicitly for this purpose: The **Satellite Diagnostic Info Gatherer**, commonly known by its command `satellite-debug`. To use this tool, simply issue that command as root. You will see the pieces of information collected and the single tarball created, like so:

```
[root@miab root]# satellite-debug
Collecting and packaging relevant diagnostic information.
Warning: this may take some time...
* copying configuration information
* copying logs
* querying RPM database (versioning of RHN Satellite, etc.)
* querying schema version and database charactersets
* get diskspace available
* timestamping
* creating tarball (may take some time): /tmp/satellite-debug.tar.bz2
* removing temporary debug tree
```

Debug dump created, stored in `/tmp/satellite-debug.tar.bz2`
 Deliver the generated tarball to your RHN contact or support channel.

Once finished, email the new file from the `/tmp/` directory to your Red Hat representative for immediate diagnosis.

Because of the RHN Satellite Server's unique closed environment, its users are provided with abilities not available to any other Red Hat Network customers. In addition, the Satellite itself will also require maintenance. This chapter discusses the procedures that should be followed to carry out administrative functions outside of standard use, as well as apply patches to the RHN Satellite Server.

8.1. Managing the Satellite Service

Since the RHN Satellite Server consists of a multitude of individual components, Red Hat provides a master service that allows you to stop, start, or retrieve status from the various services in the appropriate order: `rhn-satellite`. This helper service accepts all of the typical commands:

```
service rhn-satellite start
service rhn-satellite stop
service rhn-satellite restart
service rhn-satellite status
```

Use the `rhn-satellite` service to shut down and bring up the entire RHN Satellite Server and retrieve status messages from all of its services at once.

8.2. Updating the Satellite

If any critical updates are made to RHN Satellite Server, they will be released in the form of an Errata for the RHN Satellite Server.

For RHN Satellite Server systems that may be connected to the Internet, the best method for applying these Errata Updates is using the **Red Hat Update Agent** via Red Hat Network. Since the RHN Satellite Server is subscribed to Red Hat Network during initial installation, the user should be able to run `up2date -u` on the RHN Satellite Server or use the website at <https://rhn.redhat.com> to apply the updates.



Important

Apache RPMs do not restart the `httpd` service upon installation. Therefore, after conducting a full update of an RHN Satellite Server (such as with the command `up2date -uf`), Apache may fail. To avoid this, make sure you restart the `httpd` service after upgrading it.

For RHN Satellite Server systems that may not be connected to the Internet, the packages themselves may be retrieved using a customer account at <https://rhn.redhat.com>. Then, they can be applied manually by the customer according to instructions in the Errata Advisory.



Warning

It is *very* important to read the Errata Advisory before applying any RHN Satellite Server Errata Updates. Additional configuration steps may be required to apply certain RHN Satellite Server updates, especially if they involve the database. In such cases, the advisory will contain specific and detailed information about necessary steps that may be required.

If instead of installing new Satellite packages, you are attempting to update the server's RHN Entitlement Certificate, such as to increase its number of client systems, refer to Chapter 5 *Entitlements* for instructions.

8.3. Backing Up the Satellite

Backing up an RHN Satellite Server can be done in several ways. Regardless of the method chosen, the associated database also needs to be backed up. For the Stand-Alone Database, consult your organization's database administrator. For the Embedded Database, refer to Section 8.4 *Using **RHN DB Control*** for a complete description of this process and the options available.

Here are the minimum files and directories Red Hat recommends backing up:

- `/rhnsat/` - Embedded Database only (never to be backed up while the database is running - refer to Section 8.4.2 *Backing up the Database*)
- `/etc/sysconfig/rhn/`
- `/etc/rhn/`
- `/etc/tnsnames.ora`
- `/etc/httpd/`
- `/var/www/rhns/`
- `/var/www/html/pub/`
- `/var/satellite/redhat/1/` - custom RPMs
- `/etc/pxtdb.conf` - pertains only to RHN Satellite Server 1.1.x.

If possible, back up `/var/satellite/`, as well. In case of failure, this will save lengthy download time. Since `/var/satellite/` (specifically `/var/satellite/redhat/NULL/`) is primarily a duplicate of Red Hat's RPM repository, it can be regenerated with `satellite-sync`. Red Hat recommends the entire `/var/satellite/` tree be backed up. In the case of disconnected satellites, `/var/satellite/` *must* be backed up.

Backing up only these files and directories would require reinstalling the RHN Satellite Server ISO RPMs and reregistering the Satellite. In addition, Red Hat packages would need to be resynchronized using the `satellite-sync` tool. Finally, you would have to reinstall the `/etc/sysconfig/rhn/ssl/rhn-org-httpd-ssl-key-pair-MACHINE_NAME-VER-REL.noarch.rpm`.

Another method would be to back up all of the files and directories mentioned above but reinstall the RHN Satellite Server without reregistering it. During the installation, cancel or skip the RHN registration and SSL certificate generation sections.

The final and most comprehensive method would be to back up the entire machine. This would save time in downloading and reinstalling but would require additional disk space and back up time.

8.4. Using RHN DB Control

RHN Satellite Server with Embedded Database requires a utility for managing that database. Red Hat provides just such a tool: **RHN DB Control**. This command line utility allows you to do everything from make, verify, and restore backups to obtain database status and restart it when necessary. You *must* be the oracle user to invoke **RHN DB Control**. To begin, switch to the oracle user and issue the command:

```
su - oracle

db-control option
```

8.4.1. DB Control Options

RHN DB Control offers many command line options. To use them, as oracle insert the option and the appropriate value, if needed, after the `db-control` command.

Option	Description
<code>help</code>	Lists these <code>db-control</code> options with additional details.
<code>backup DIRNAME</code>	Backs up the database to the directory specified.
<code>examine DIRNAME</code>	Examines the contents of a backup directory. Returns the timestamp of backup creation and reports on its contents.
<code>report</code>	Reports on current usage of database space.
<code>restore DIRNAME</code>	Restores the database from backup kept in <code>DIRNAME</code> . Database must be stopped for this command to run successfully.
<code>start</code>	Starts the database instance. This can also be accomplished by issuing the <code>service rhn-database start</code> command as root.
<code>status</code>	Shows the current status of the database, either "running" or "offline".
<code>stop</code>	Stops the database instance. This can also be accomplished by issuing the <code>service rhn-database stop</code> command as root.
<code>verify DIRNAME</code>	Verifies the contents of the backup kept in <code>DIRNAME</code> . This command checks the md5sums of each of the files kept in the backup.

Table 8-1. RHN DB Control Options

8.4.2. Backing up the Database

Red Hat recommends performing nightly backups of the Embedded Database and moving the resulting directory to another system either NFS, SCP, FTP, etc. Preferably, this backup system resides off-site. To conduct a backup, shut down the database and related services first by issuing the following commands in this order as root:

```
service httpd stop
service taskomatic stop
service rhn-database stop
```

Then switch to the oracle user and issue this command to initiate the backup:

```
db-control backup DIRNAME
```

Backup files will be stored in the directory specified. Note that this is a cold backup; The database must be stopped before running this command. This process takes several minutes. The first backup will be a good indicator of how long subsequent backups will take.

Once the backup is complete, return to root user mode and restart the database and related services with these commands in this order:

```
service rhn-database start
service taskomatic start
service httpd start
```

You should then copy that backup to another system using **rsync** or another file-transfer utility. Red Hat strongly recommends scheduling the backup process automatically using cron jobs. For instance, back up the system at 3 a.m. and then copy the backup to the separate repository (partition, disk, or system) at 6 a.m.

8.4.3. Verifying the Backup

Backing up the Embedded Database is useful only if you can ensure the integrity of the resulting backup. **RHN DB Control** provides two methods for reviewing backups, one brief, one more detailed. To conduct a quick check of the backup's timestamp and determine any missing files, issue this command as oracle:

```
db-control examine DIRNAME
```

To conduct a more thorough review, including checking the md5sum of each of the files in the backup, issue this command as oracle:

```
db-control verify DIRNAME
```

8.4.4. Restoring the Database

RHN DB Control makes Embedded Database restoration a relatively simple process. As in the creation of backups, you will need to shut down the database and related services first by issuing the following commands in this order as root:

```
service httpd stop
service taskomatic stop
service rhn-database stop
```

Then switch to the oracle user and issue this command, including the directory containing the backup, to begin the restoration:

```
db-control restore DIRNAME
```

This not only restores the Embedded Database but first verifies the contents of the backup directory using md5sums. Once the restoration is complete, return to root user mode and restart the database and related services with these commands in this order:

```
service rhn-database start
service taskomatic start
service httpd start
```

8.5. Cloning the Satellite with Embedded DB

You may limit outages caused by hardware or other failures by cloning the Satellite with Embedded Database in entirety. The secondary Satellite machine can be prepared for use if the primary fails. To clone the Satellite, conduct these tasks:

1. Install RHN Satellite Server with Embedded Database (and a base install of Red Hat Enterprise Linux AS) on a separate machine, skipping the SSL Certificate generation step.
2. Back up the primary Satellite's database daily using the commands described in Section 8.4.2 *Backing up the Database*. If this is done, only changes made the day of the failure will be lost.
3. Establish a mechanism to copy the backup to the secondary Satellite and keep these repositories synchronized using a file transfer program such as **rsync**. If you're using a SAN, copying isn't necessary.
4. Use **RHN DB Control's** `restore` option to import the duplicate data.
5. If the primary Satellite fails, transfer the SSL certificates from it to the secondary. Refer to the Sharing Certificates section of the *RHN Client Configuration Guide* for precise instructions.
6. Change DNS to point to the new machine or configure your load balancer appropriately.

8.6. Establishing Redundant Satellites with Stand-Alone DB

In keeping with the cloning option available to Satellite with Embedded Database, you may limit outages on Satellites with Stand-Alone Database by preparing redundant Satellites. Unlike cloning a Satellite with Embedded Database, redundant Satellites with Stand-Alone Database may be run as active, as well as standby. This is entirely up to your network topology and is independent of the steps listed here.

To establish this redundancy, first install the primary Satellite normally, except the value specified in the Common Name field for the SSL certificate must represent your high-availability configuration, rather than the hostname of the individual server. Then:

1. Prepare the Stand-Alone Database for failover using Oracle's recommendations for building a fault-tolerant database. Consult your database administrator.
2. Install RHN Satellite Server with Stand-Alone Database (and a base install of Red Hat Enterprise Linux AS) on a separate machine, skipping the database setup and blow away tablespace steps and the SSL certificate and bootstrap script generation steps. You should still include the same RHN account and database connection information provided during the initial Satellite install and register the new Satellite.

If your original SSL certificate does not take your high-availability solution into account, you may create a new one with a more appropriate Common Name value now. In this case, you may also generate a new bootstrap script that captures this new value.

3. After installation, copy the following files from the primary Satellite to the secondary Satellite:
 - `/etc/rhn/rhn.conf`
 - `/etc/tnsnames.ora`
 - `/var/www/rhns/server/secret/rhnSecret.py`
4. Copy and install the server-side SSL certificate RPMs from the primary Satellite to the secondary. Refer to the Sharing Certificates section of the *RHN Client Configuration Guide* for precise instructions. Remember, the Common Name value must represent the combined Satellite solution, not a single machine's hostname.

If you generated a new SSL certificate during secondary Satellite installation to include a new Common Name value, instead copy the RPMs from the secondary to the primary Satellite and redistribute the client-side certificate. If you also created another bootstrap script, you may use this to install the certificate on client systems.

5. If you did not create a new bootstrap script, copy the contents of `/var/www/html/pub/bootstrap/` from the primary Satellite to the secondary. If you did generate a new one, copy that directory's contents to the primary Satellite.
6. Turn off the **RHN Task Engine** on the secondary Satellite with the following command:

```
/sbin/service taskomatic stop
```

You may use custom scripting or other means to establish automatic start-up/failover of the **RHN Task Engine** on the secondary Satellite. Regardless, it will need to be started upon failover.

7. Share channel package data (by default located in `/var/satellite`) between the Satellites over some type of networked storage device. This eliminates data replication and ensures a consistent store of data for each Satellite.
8. Make the various Satellites available on your network via Common Name and a method suiting your infrastructure. Options include round-robin DNS, a network load balancer, and a reverse-proxy setup.

8.7. Conducting Satellite-Specific Tasks

Using a RHN Satellite Server is quite similar to using the hosted version of Red Hat Network. For this reason, you should consult the *RHN Reference Guide* to obtain detailed instructions to standard tasks, such as editing System Profiles and updating packages. Tasks directly related to managing custom channels and Errata are covered in the *RHN Channel Management Guide*. This section seeks to explain activities available only to Satellite customers.

8.7.1. Using the Tools menu

In addition, to the standard categories available to all users through the top navigation bar, Satellite Organization Administrators also have access to a **Tools** menu. Clicking this opens the **RHN Internal Tools** page.

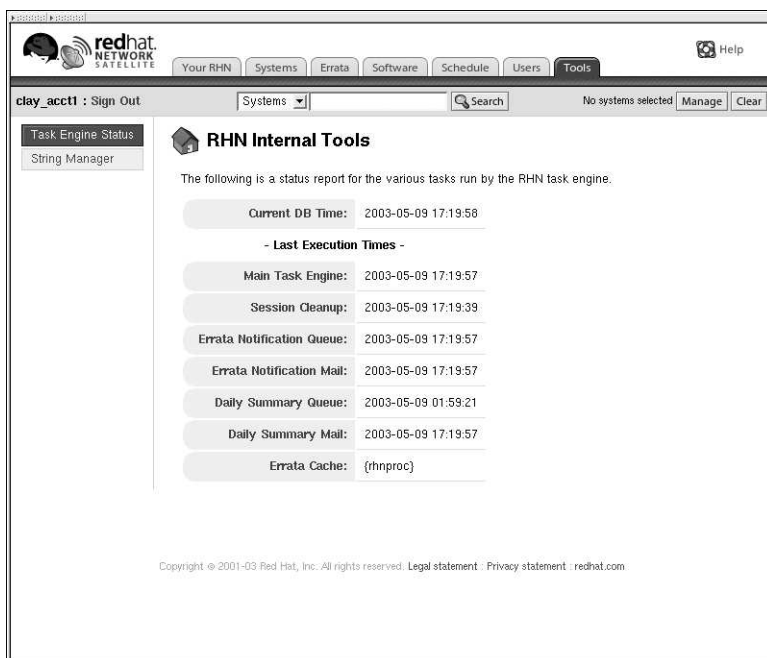


Figure 8-1. Internal Tools

To refresh the view of channels that have been updated but do not yet reflect those modifications on the Satellite website, click the **Update Errata cache now** link on this page.

8.7.1.1. Maintaining the RHN Task Engine

The default display shows the status of the **RHN Task Engine**. This tool is a daemon that runs on the Satellite server itself and performs routine operations, such as database cleanup, Errata mailings, etc., that must be performed in the background. The page displays the execution times for various activities carried out by the daemon.

Administrators should ensure the **RHN Task Engine** stays up and running. If this daemon hangs for any reason, it can be restarted using its filename, `taskomatic`. As root, run the command:

```
/sbin/service taskomatic restart
```

Other service commands can also be used, including `start`, `stop`, and `status`.

8.7.1.2. Accessing the String Manager

The **Tools** menu also offers a **String Manager** function. This page allows you to edit footers, headers and other universal information displayed in emails, error messages and elsewhere.

8.7.2. Deleting Users

Because of the isolated environment in which RHN Satellite Servers operate, Satellite customers have been granted the ability to delete users. To access this functionality, click **Users** in the top navigation bar of the RHN website. In the resulting User List, click the name of the user to be removed. This takes you to the **User Details** page. Click the **delete user** link at the top-right corner of the page.



Figure 8-2. User Deletion

A confirmation page will appear explaining that this removal is permanent. To continue, click **Delete User** at the bottom-right corner of the page.

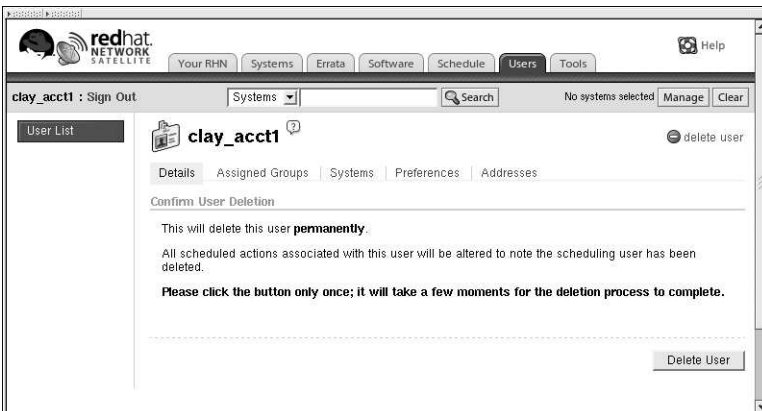


Figure 8-3. User Delete Confirmation

Many other options exist for managing users. You can find instructions for them in the RHN website chapter of the *RHN Reference Guide*.

8.8. Automating Synchronization

Manually synchronizing the RHN Satellite Server repository with Red Hat Network can be an arduous task. In addition, staff levels tend to be highest at peak usage times. For this reason, Red Hat encourages you to automate synchronization in late evening or early morning to better balance load and ensure quick synchronization. *Further, Red Hat strongly recommends synchronization occur randomly for best performance.*

This automation can be set easily by the addition of a simple cron job. To do this, edit the crontab as root:

```
crontab -e
```

This opens the crontab in a text editor, by default Vi. Another editor can be used by first changing the EDITOR variable, like so: `export EDITOR=gedit`.

Once opened, use the first five fields (minute, hour, day, month, and weekday) to schedule the synchronization. Remember, hours use military time. Edit the crontab to include random synchronization, like so:

```
0 1 * * * perl -le 'sleep rand 9000' && satellite-sync --email >/dev/null 2>/dev/null
```

This particular job will run randomly between 1:00 a.m. and 3:30 a.m. system time each night and redirect `stdout` and `stderr` from `cron` to prevent duplicating the more easily read message from `satellite-sync`. Options other than `--email` can also be included. Refer to Section 6.1.2 *Import/Sync Options* for the full list of options. Once you exit from the editor, the modified crontab is installed immediately.

8.9. Implementing PAM Authentication

As security measures become increasingly complex, administrators must be given tools that simplify their management. For this reason, RHN Satellite Server supports network-based authentication systems via Pluggable Authentication Modules (PAM). PAM is a suite of libraries that helps system administrators integrate the Satellite with a centralized authentication mechanism, thus eliminating the need for remembering multiple passwords.

RHN Satellite Server supports, LDAP, Kerberos, and other network-based authentication systems via PAM. To enable the Satellite to use PAM and your organization's authentication infrastructure, complete the following tasks.

Set up a PAM service file (usually `/etc/pam.d/rhn-satellite`) and have the Satellite use it by adding the following line to `/etc/rhn/rhn.conf`:

```
pam_auth_service = rhn-satellite
```

This assumes the PAM service file is named `rhn-satellite`.

Enable a certain user to authenticate against PAM. Do this by clicking the **Use PAM Authentication** button on the **User Details** page.

As an example, to authenticate against Kerberos one could put the following in `/etc/pam.d/rhn-satellite`:

```
#%PAM-1.0
auth      required      /lib/security/pam_env.so
auth      sufficient    /lib/security/pam_krb5.so no_user_check
auth      required      /lib/security/pam_deny.so
account   required      /lib/security/pam_krb5.so no_user_check
```

Please note that changing the password on the RHN website will change only the local password on the RHN Satellite Server, which may not be used at all if PAM is enabled for that user. In the above example, for instance, the Kerberos password will not be changed.

8.10. Enabling Push to Clients

In addition to allowing client systems to regularly poll the Satellite for scheduled actions, you may enable the Satellite to immediately initiate those tasks on Provisioning-entitled systems. This bypasses the typical delay between scheduling an action and the client system checking in with RHN to retrieve it.



Important

SSL must be employed between the Satellite and its clients systems for this feature to work. If the SSL certificates are not available, the daemon on the client system fails to connect.

To take advantage of this feature, you must first configure your firewall rules to allow connections on the required port(s), as described in Section 2.4 *Additional Requirements*.

Then you must install the `osa-dispatcher` package, which can be found in the RHN Satellite Server software channel for the Satellite within the central RHN website. Once installed, start the service on the Satellite as root using the command:

```
service osa-dispatcher start
```

Finally, install the `osad` package on all client systems to receive pushed actions. The package can be found within the RHN Tools child channel for the systems on the RHN Satellite Server. Once installed, start the service on the client systems as root using the command:

```
service osad start
```

Like other services, `osa-dispatcher` and `osad` accept `stop`, `restart`, and `status` commands, as well.

Keep in mind, this feature depends on the client system recognizing the fully qualified domain name (FQDN) of the Satellite. This name and not the IP address of the server must be used when configuring the **Red Hat Update Agent**. Refer to the *RHN Client Configuration Guide* for details.

Now when you schedule actions from the Satellite on any of the push-enabled systems, the task will begin immediately rather than wait for the system to check in.



Sample RHN Satellite Server Configuration File

The `/etc/rhn/rhn.conf` configuration file for the RHN Satellite Server provides a means for you to establish key settings. Be warned, however, that errors inserted into this file may cause Satellite failures. So make configuration changes with caution.

You should be particularly concerned with the following parameters: `traceback_mail`, `default_db`, and `server.satellite.http_proxy`. Review the sample and its comments, beginning with a hash mark (`#`), for additional details.

```
#/etc/rhn/rhn.conf example for an RHN Satellite
#-----

# Destination of all tracebacks, such as crash information, etc.
traceback_mail = test@pobox.com, test@redhat.com

# Location of RPMs (Red Hat and custom) served by the RHN Satellite
mount_point = /var/satellite

# Corporate gateway (hostname:PORT):
server.satellite.http_proxy = corporate_gateway.example.com:8080
server.satellite.http_proxy_username =
server.satellite.http_proxy_password =

# Database connection information username/password@SID
default_db = test01/test01@test01

### DON'T TOUCH ANY OF THE FOLLOWING ###
web.satellite = 1

web.session_swap_secret_1 = ea6c79f71cfcf307d567fed583c393b9
web.session_swap_secret_2 = 0ldee83a7b7f27157f5335744eb02327
web.session_swap_secret_3 = 4e89e7697ce663149ca9e498cbc08b4f
web.session_swap_secret_4 = a0fed2d77a950fc9a800b450a45e89d2

web.session_secret_1 = 24bc562e04c9b93f5be94f793738e104
web.session_secret_2 = 7667a7c2db311blea0427lecc1b82314
web.session_secret_3 = 442e7dc4f06f63eba9a0408d499c6a8d
web.session_secret_4 = 587a0db47856f685d989095629a9bd6f

encrypted_passwords = 1

web.param_cleansers = RHN::Cleansers->cleanse
web.base_acls = RHN::Access

web.default_taskmaster_tasks = RHN::Task::SessionCleanup,
                               RHN::Task::ErrataQueue, RHN::Task::ErrataEngine,
                               RHN::Task::DailySummary, RHN::Task::SummaryPopulation,
                               RHN::Task::RHNProc, RHN::Task::PackageCleanup

web.rhn_gpg_backend_module = RHN::GPG::OpenPGP

web.restrict_mail_domains =
```


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